

# MINNESOTA DEPARTMENT OF TRANSPORTATION

City of Rochester, Minnesota

## Department Of Public Works

TRAFFIC SIGNAL SYSTEM AT NORTH BROADWAY AND 1ST STREET NORTH



### CONVENTIONAL SIGNS AND ABBREVIATIONS

CORPORATE LIMITS	---	ACRE	A.
SECTION LINE	---	ADJUST	ADJ.
RIGHT OF WAY LINE (STATE)	---	AGGREGATE	AGG.
PROPERTY LINE (STREET)	---	APPROACH	APP.
ADDITION LINE	---	BENCH MARK	B.M.
SURVEY LINE	---	BITUMINOUS	BIT.
CENTER LINE	---	BRIDGE	BR.
WIRE FENCE	---	BUILDING	BLDG.
STONE WALL OR FENCE	---	CAST IRON PIPE	C.I.P.
HEDGE	---	CATCH BASIN	C.B.
GUARD RAIL	---	CENTER LINE	C.
CREEK OR RIVER	---	CENTER TO CENTER	C TO C
DRY RUN	---	CLAY SEWER PIPE	C.S.P.
RAILROAD	---	CONCRETE	CONC.
RAILROAD RIGHT OF WAY LINE	---	CONSTRUCT	CONST.
CURB & GUTTER INP.	---	CORNER	COR.
SIDEWALK INP.	---	CORRUGATED METAL PIPE	C.M.P.
SANITARY SEWER INP.	---	CORRUGATED METAL PIPE ARCH	C.M.P.-A
STORM SEWER INP.	---	CRUSHED ROCK	CR. RK.
WATERMAIN, GATEVALVE & BOX INP.	---	CURB & GUTTER	C & G
ELECTRIC UNDERGROUND INP.	---	DEFLECTION LEFT	D L
TELEPHONE UNDERGROUND INP.	---	DEFLECTION RIGHT	D R
STEAM MAIN INP.	---	DEGREE OF CURVE	D
GAS MAIN INP.	---	DELTA OR INTERSECTION ANGLE	Δ
CURB INP.	---	DRIVE	DR.
HYDRANT INP.	---	DRIVEWAY	DRWY.
TELEPHONE, POWER POLES	---	DROP INLET	D.I.
LIGHT POLES	---	DUCTILE IRON PIPE	D.I.P.
TRAFFIC SIGNAL	---	EAST	E.
FIRE ALARM BOX	---	ELEVATION	EL.
RAILROAD CROSSING SIGN	---	EMBANKMENT	EMB.
RAILROAD CROSSING BELL	---	ENTRANCE	ENT.
TREE	---	EQUATION	EQ.
STUMP	---	ESTIMATE	EST.
BUILDING	---	EXCAVATION	EXC.
IRON PIPE	---	EXPANSION	EXP.
STONE MONUMENT	---	FLOW LINE	F.L.
MANHOLE INP.	---	FOOT	FT.
BRICK INP.	---	FOUNDATION	FD'N.
BRIDGE INP.	---	FRAME	FR.
CULVERT INP.	---	FURNISH AND INSTALL	F. & I.
CATCH BASIN INP.	---	GALLON	GV.
CURB & GUTTER CONST.	---	GRATE	GR.
SIDEWALK CONST.	---	HIGH WATER	H.W.
SANITARY, STORM SEWER CONST.	---	HIGHWAY	HWY.
WATERMAIN CONST.	---	HORIZONTAL	HORIZ.
MANHOLE CONST.	---	HYDRANT	HYD.
CATCH BASIN CONST.	---	INLET	INL.
HYDRANT CONST.	---	INPLACE	INPL.
CROSS	---	INSTALL	INST.
TEE	---	INVERT	INV.
TAPPING MACHINE SLEEVE & VALVE	---	IRON PIPE	I. P.
BEND, ELBOW	---	JUNCTION	JCT.
INCREASER, DECREASER	---	LEFT	L.T.
CONCRETE	---	LENGTH OF CURVE	L.C.
SAND	---	LINEAL	LIN.
CRUSHED ROCK	---	L.W. WATER	L.W.
BITUMINOUS	---	MANHOLE	M.H.
CLEAR & GRUB TREE	---	MINIMUM	MIN.
SW, C&G, CONC BASE, DRWY-REMOVE(GRD & ALIGN)	---	MISCELLANEOUS	MISC.
SW, C&G, CONC BASE, DRWY-REMOVE(CONDEMED SW)	---	MONUMENT	MON.
SOIL BORING LOCATION	---	NORTH	N.
		NORTH EAST	N.E.
		NORTH WEST	N.W.
		NUMBER	NO.
		OUTLET	OUTL.
		PERFORATED	PERF.
		POINT OF CURVATURE	P.C.
		POINT OF INTERSECTION	P.I.
		POINT OF TANGENCY	P.T.
		POINT ON TANGENT	P.O.T.
		RADIUS, ROCK, RANGE	R.
		RAILROAD	R.R.
		REINFORCED	REINF.
		REINFORCED CONCRETE PIPE	R.C.P.
		RETURN	RET.
		RIGHT	RT.
		SANITARY	SAN.
		SEWER	SEW.
		SIDEWALK, SOUTH WEST	S.W.
		SOUTH	S.
		SOUTH EAST	S.E.
		SPECIFICATION, SPECIAL	SPEC.
		STANDARD	STD.
		STATION	STA.
		STORM, STATE, STUCCO	ST.
		STREET, STONE, STEEL	ST.
		SUBDRAIN	SD, SUBD
		SURFACE	SURF.
		TANGENT	TAN.
		TURNING POINT, TELEPHONE POLE	T.P.
		VARIABLE	VAR.
		VEHICULAR MEASURE	V.M.
		VERTICAL	VERT.
		VERTICAL CURVE	V.C.
		VETRIFIED	VIT.
		WEST, WATER	W.

NOTE: SECTION NUMBERS READ FROM SOUTH

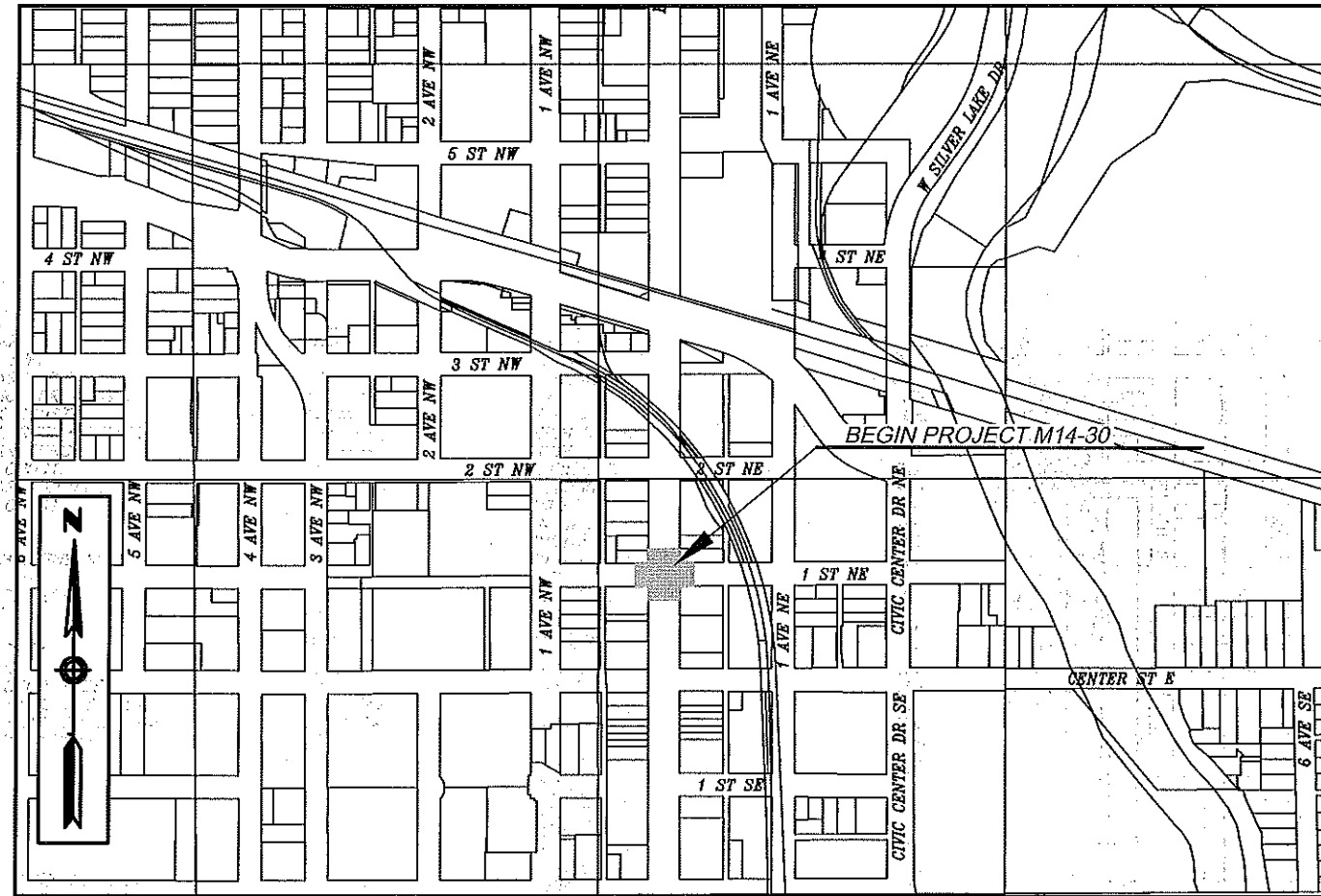


HORIZONTAL SCALE

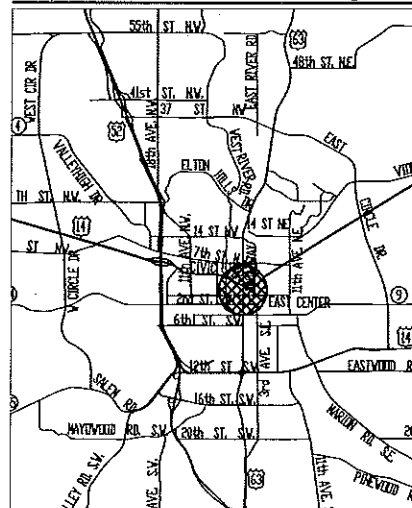
VERTICAL SCALE

TOWNSHIP 107 RANGE 14 SECTION 35

GROSS LENGTH	NA FEET	NA MILES
BRIDGE LENGTH	NA FEET	NA MILES
EXCEPTION LENGTH	NA FEET	NA MILES
NET LENGTH	NA FEET	NA MILES



City of Rochester and surrounding area



APPROXIMATE PROJECT LOCATION

LEGAL DESCRIPTION:



PROJECT LOCATION  
OLMSTED COUNTY  
ROCHESTER DISTRICT

### GOVERNING SPECIFICATIONS

State of Minnesota  
The 2014 edition of the Minnesota Department of Transportation "Standard Specifications for Construction", and the 2014 edition of the "Material Lab Supplemental Specifications for Construction" shall govern except as modified by special provision.

All traffic control devices shall conform to and be installed in accordance with the most recent edition of "Minnesota Manual on Uniform Traffic Control Devices" (MN MUTCD) and part VI, "Field Manual for Temporary Traffic Control Zone Layouts".

"City of Rochester Standard Specifications for Utility and Street Construction" 4/25/13

### UTILITY QUALITY LEVEL

The subsurface utility information in this plan is utility quality level D. This quality level was determined according to the guidelines of CHASCE 38-2, entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data."

### INDEX TO PLANS

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DETAILS	2-5
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REMOVALS	7
GRADING	8
STRIPING	9
SIGNAL PLANS	10-12

This plan contains 13 Total sheets



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Department Of Public Works

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Calvin Feltz, Design Technician Date 5-7-15

Russell Kelm, Design Engineer: I hereby certify that this plan was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the state of Minnesota.  
Date: 5-7-15 Registration Number 24667

Approved: Douglas Nelson, Assist. City of Rochester Engineer Date 5/9/15

Approved: Richard Freese, City of Rochester Engineer Date 5/7/15

Project No M14-30 J6053  
Sheet 1 of 13 Sheets

STATEMENT OF ESTIMATED QUANTITIES							
NOTES	SPEC. REF. NUMBER	ITEM DESCRIPTION	UNIT	PARTICIPATING	NON-PARTICIPATING	STORM SEWER	TOTAL ESTIMATED QUNTIITY
1 STREET (350)							
	2021.501/00010	MOBILIZATION	LS	1.00			1.00
	2104.501/00022	REMOVE CURB AND GUTTER	LF	157.00			157.00
1	2531.501/02320	CONCRETE CURB & GUTTER DESIGN B624	LF	158.00			158.00
	2563.601/00010	TRAFFIC CONTROL	LS	1.00			1.00
	2573.530/00010	STORM DRAIN INLET PROTECTION	EACH	2.00			2.00
	2582.603/61112	12" SOLID LINE WHITE-EPOXY (WR)	LF	349.00			349.00
2 PED FACILITIES (550)							
	2104.503/00021	REMOVE CONCRETE WALK	S F	1917.00			1917.00
	2521.501/00060	6" CONCRETE WALK	S F	1868.00			1868.00
	2531.618/00010	TRUNCATED DOMES	S F	96.00			96.00
3 TRAFFIC (650)							
	2104.509/00155	REMOVE LIGHT FOUNDATION	EACH	4.00			4.00
	2104.523/00421	SALVAGE LUMINAIRE	EACH	4.00			4.00
	2565.511/00010	TRAFFIC CONTROL SIGNAL SYSTEM	SIGS	1.00			1.00

NOTES:  
(1) INCLUDES TRANSITION CURB

STANDARD DETAIL PLATES	
CITY OF ROCHESTER	
NO.	DETAIL PLATE
2-01 E	CONCRETE CURB & GUTTER
2-06 D	CURB & GUTTER REINFORCEMENT AT CATCH BASINS
2-14 J	PEDESTRIAN CURB RAMP
2-15 F	SIDEWALK DETAILS
7-05 A	INLET PROTECTION

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION SHALL APPLY ON THIS PROJECT	
STATE OF MINNESOTA	
NO.	DETAIL PLATE
8090I	Standard Barricades
8106C	Equipment Pad B
8110E	Traffic Signal Bracketing (Pole Mounted)
8111E	Traffic Signal Bracketing (Pedestal Mounted) (3 Sheets)
8112G	Pedestal Foundation (Traffic Control Signals)
8114A	P.V.C. Handhole/Pulbox (No Vehicle Load) (2 Sheets)
8117F	Precast Concrete Handhole (with Vehicle Load) (2 Sheets)
8118D	Service Equipment & Pole Traffic Control Signals
8119C	Ground Mounted Cabinet Foundation
8120P	Pole Foundation (PA85)
8123G	Pole and Mast Arm Luminaires and Traffic Lights Assembly (For All Pole Types) (2 Sheets)
8126K	Pole Foundation (PA90 and PA100)

Revision comment:   
Permit:   
  
I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.  
  
Russell A. Klem Date: 5-6-15 Lic. No. 24667

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City of Rochester, Minnesota  
Department of Public Works

ESTIMATED QUANTITIES AND DETAILS FOR TRAFFIC  
SIGNAL SYSTEM AT NORTH BROADWAY AND 1ST  
STREET NORTH

Project No. M14-30  
Sheet 2 of 13 Sheets

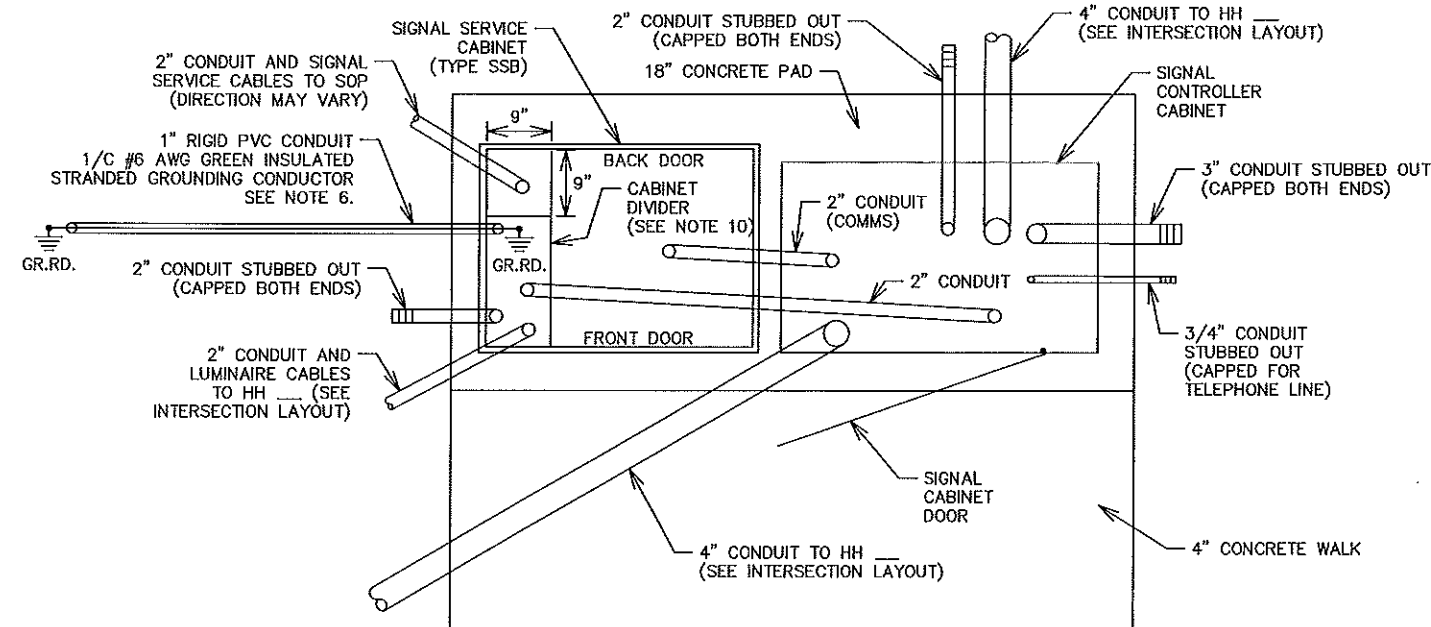
J6053

Designer: CMV  
Checker: RJK

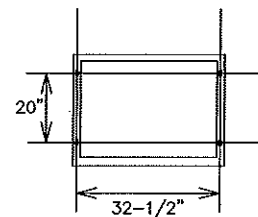
# TYPICAL PAD WITH CONTROLLER CABINET AND SERVICE CABINET

SEE INTERSECTION LAYOUT FOR CABLE INFORMATION (NOT TO SCALE)

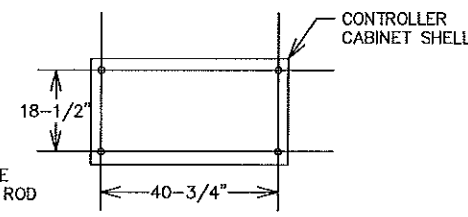
## PLAN VIEW



## S.S.B. SERVICE CABINET BOLT PATTERN



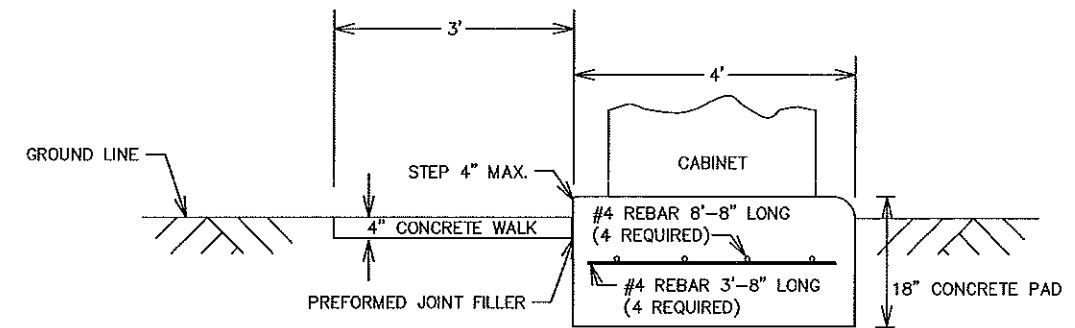
## CONTROLLER CABINET TYPE "P" & "R" BOLT PATTERN



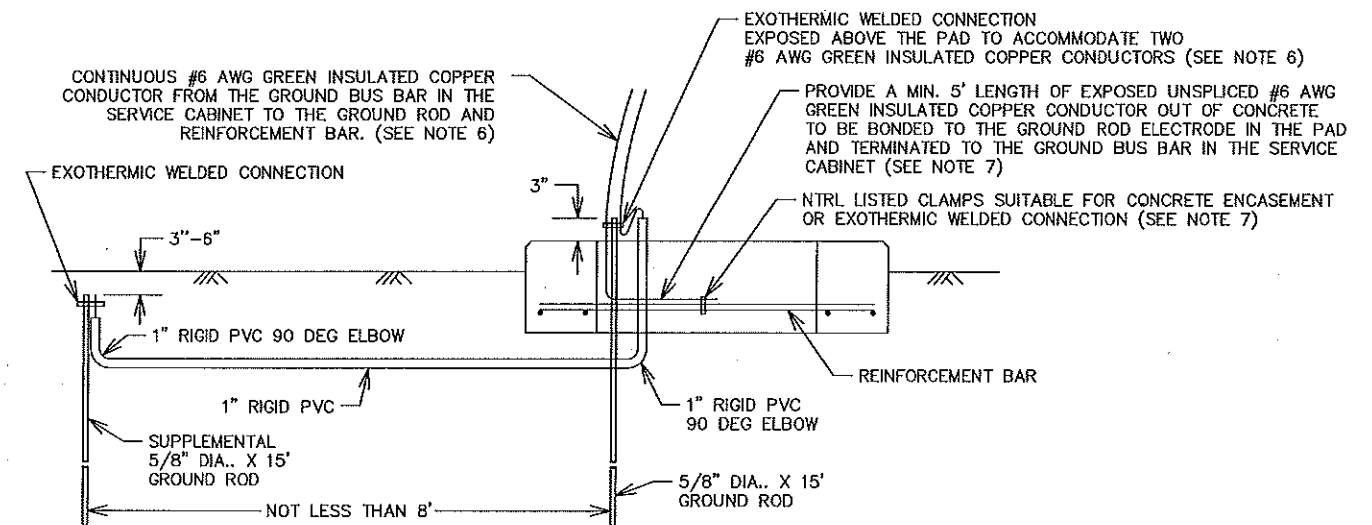
DIMENSION SHOWN ARE CENTER ROD TO CENTER ROD

- NOTES:
- THE ANCHOR RODS, NUTS, WASHERS AND RUBBER GASKET FOR THE CONTROLLER CABINET SHALL BE FURNISHED BY MNDOT.
  - THE OUTER EDGE OF THE ENTIRE EQUIPMENT PAD AND CONCRETE WALK SHALL BE BEVELED OR CHAMFERED IN A NEAT MANNER AS DIRECTED BY THE ENGINEER.
  - THE TOP OF THE CONDUITS SHALL BE CAPPED UNTIL CABLES ARE PULLED IN.
  - CONDUIT SHALL PROJECT A MINIMUM OF 2" ABOVE THE CONCRETE AND SHALL BE LOCATED INSIDE THE CABINET WHERE DIRECTED BY THE ENGINEER, BUT SHALL NOT INTERFERE WITH THE CABINET FUNCTIONS (SUPPORTING MEMBERS, ETC.).
  - CONCRETE MIX 3A32 OR EQUAL SHALL BE USED FOR THE EQUIPMENT PAD AND SIDEWALK.
  - SUPPLY TWO 15 FOOT GROUND ROD ELECTRODES IN ACCORDANCE WITH 2545.3R. PROVIDE ONE GROUND ROD IN THE EQUIPMENT PAD IN ACCORDANCE WITH 2545.3 F.3 AND THE OTHER OUTSIDE OF THE PAD WITH A MINIMUM OF 8 FEET OF SEPARATION BETWEEN ELECTRODES. BOND THE TWO GROUND RODS TOGETHER WITH ONE CONTINUOUS LENGTH UNSPLICED CONDUCTOR FROM THE OUTER MOST GROUND ROD TO THE GROUND BUS BAR IN THE CABINET. EXOTHERMICALLY WELD THE 6 AWG STRANDED GREEN INSULATED CONDUCTOR TO THE GROUND RODS. PLACE THE BONDING CONNECTION TO THE EQUIPMENT PAD GROUND ROD ABOVE THE CONCRETE. APPLY DE-OX COMPOUND TO THE GROUNDING CONNECTIONS AFTER FINAL ASSEMBLY.
  - BOND A #6 AWG GREEN INSULATED GROUNDING CONDUCTOR TO THE REBAR CAGE PRIOR TO CONCRETE POURING OPERATIONS. ENSURE THE CONDUCTOR IS PLACED IN THE LOAD SIDE OF THE CABINET. TERMINATE THE GREEN INSULATED 6 AWG GROUND CONDUCTOR ON THE GROUND BUS IN THE SERVICE CABINET WITHOUT SPLICES.
  - CONDUITS WITH BOTH ENDS TERMINATING WITHIN THE PAD SHALL NOT BE PLACED BELOW THE CONCRETE.
  - THE EXACT LOCATION OF CONDUITS WITHIN THE PAD SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.
  - CORRECT PLACEMENT OF CONDUIT TO THE LEFT OF THE CABINET DIVIDER IS CRITICAL.
  - ANCHOR RODS SHALL PROJECT A MINIMUM OF 3" ABOVE THE CONCRETE BUT SHALL NOT INTERFERE WITH THE CABINET FUNCTIONS (SUPPORTING MEMBERS, ETC.).
  - CABINETS TO BE CENTERED (LEFT & RIGHT) ON THE PAD.
  - BRUSH ON ANTI-SEIZE LUBRICANT MUST BE APPLIED TO ALL ANCHOR ROD THREADS PROTRUDING ABOVE THE CONCRETE PAD BEFORE THE CABINET IS SET.

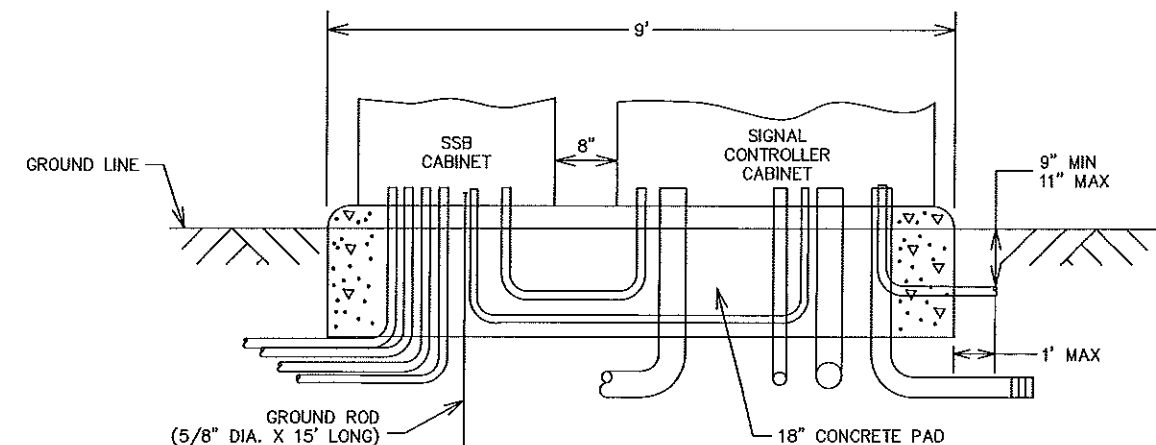
## SIDE VIEW

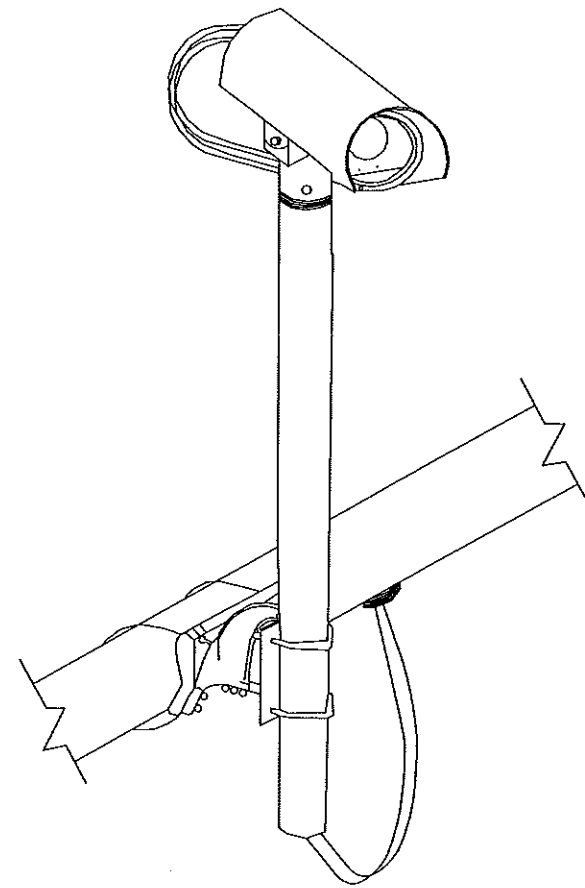


## GROUNDING ELECTRODE SYSTEM



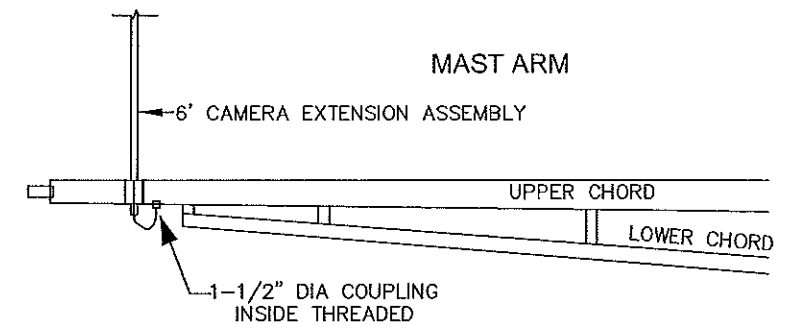
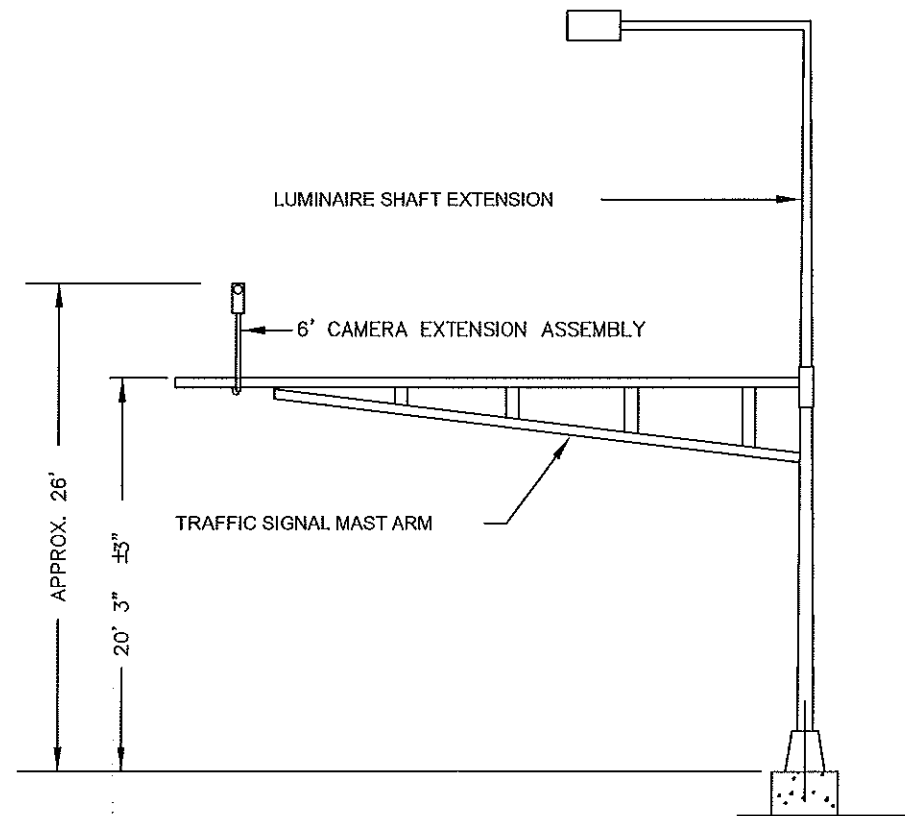
## FRONT VIEW



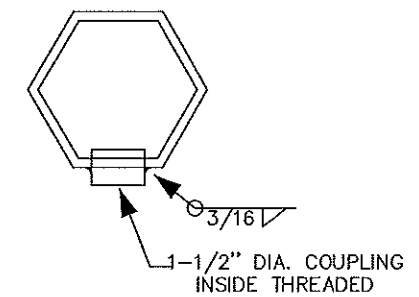


MAST ARM CAMERA INSTALLATION

# TYPICAL MAST ARM CAMERA MOUNTING DETAILS

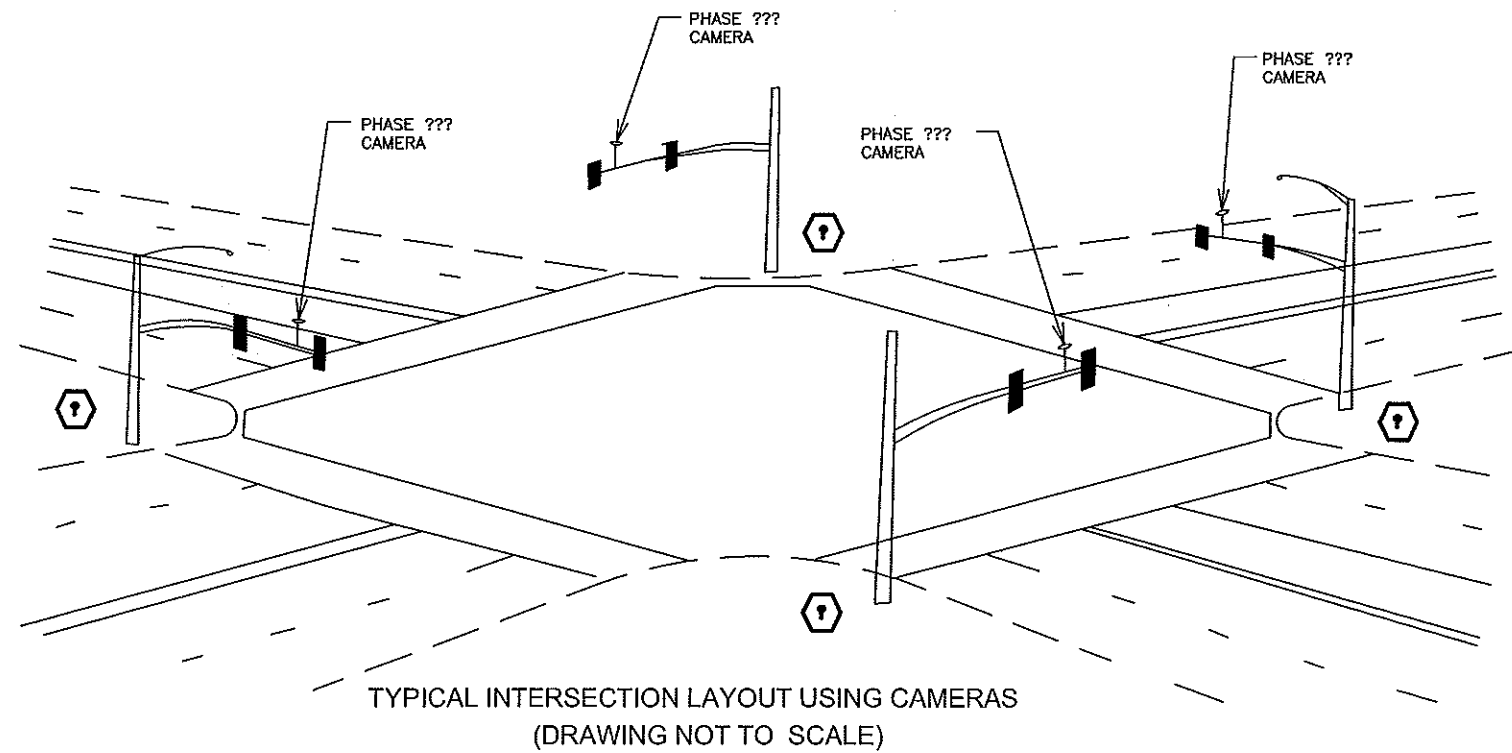


UPPER CHORD SECTION



## NOTES:

- 1) ALL CAMERA DETECTION EQUIPMENT SHALL BE FURNISHED BY CITY AND INSTALLED BY CONTRACTOR.
- 2) IT IS DESIRABLE FOR CABLES BETWEEN THE CAMERA AND THE TRAFFIC SIGNAL CONTROL CABINET TO BE CONTINUOUS, HOWEVER, A SPLICE (APPROVED FOR OUTDOOR USE) WILL BE ALLOWED IN THE TRANSFORMER BASE OF THE SIGNAL POLE.
- 3) CAMERA DETECTOR CABLES SHALL BE RUN THROUGHOUT INSIDE OF POLE AND MAST ARM OVER TO CAMERA (NO SPLICE).
- 4) CABLES FOR CAMERA OPERATION SHALL BE AS INDICATED IN THE SPECIAL PROVISIONS AND SHALL BE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE MANUFACTURER OF THE VIDEO DETECTION SYSTEM USED.
- 5) WHERE THE CABLES ARE ROUTED THROUGH THE MAST ARM, PROVIDE BUSHINGS TO PROTECT THE CABLES.
- 6) THE 6-FOOT CAMERA MOUNTING EXTENSION ASSEMBLY SHALL CONSIST OF A MAST ARM MOUNTING BRACKET THAT IS CONSTRUCTED OF CAST ALUMINUM. THE MAST ARM MOUNTING BRACKET SHALL BE ATTACHED TO THE MAST ARM WITH STAINLESS STEEL STRAPS, USING STAINLESS STEEL MOUNTING HARDWARE.
- 7) A 1 1/2" HALF COUPLING, 1 1/2" PIPE NIPPLE AND CONDUIT OUTLET BODY FOR CAMERA CABLES SHALL BE F&I ON THE UNDER SIDE OF MAST ARM SEE SIGNAL LAYOUT FOR LOCATION OF HUB.

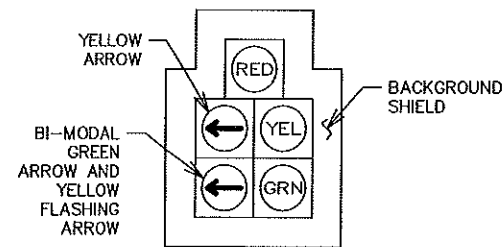


TYPICAL INTERSECTION LAYOUT USING CAMERAS  
(DRAWING NOT TO SCALE)

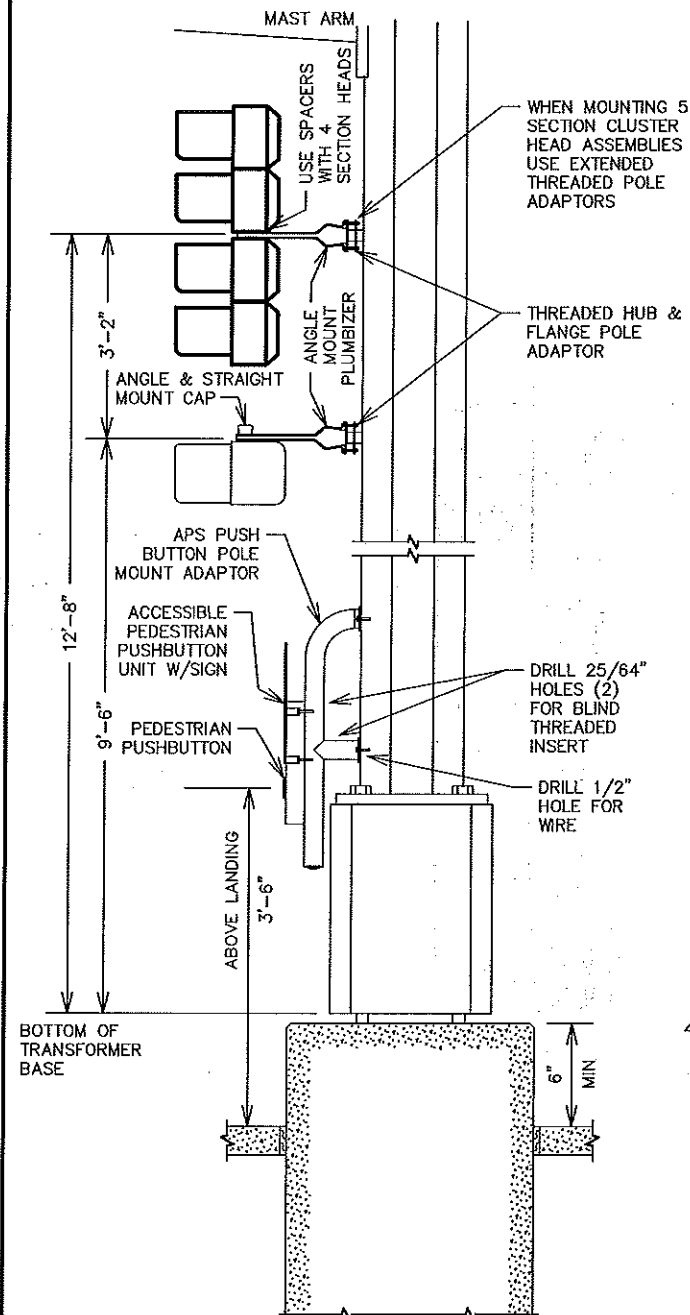
Revision comment: \_\_\_\_\_  
 Prepared: \_\_\_\_\_  
 I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.  
 Russell A. Khan Date: 5-6-15 Lic. No. 24657

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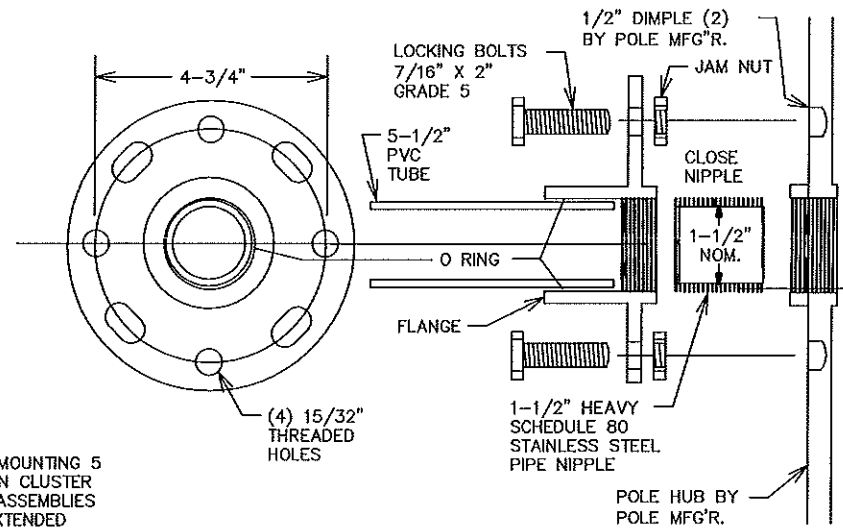
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 Designer: CMF  
 Checker: RUK  
 Project No. M14-30 J 6053  
 Sheet 4 of 13 Sheets  
 DETAILS FOR TRAFFIC SIGNAL AT NORTH BROADWAY AND 1ST STREET NORTH



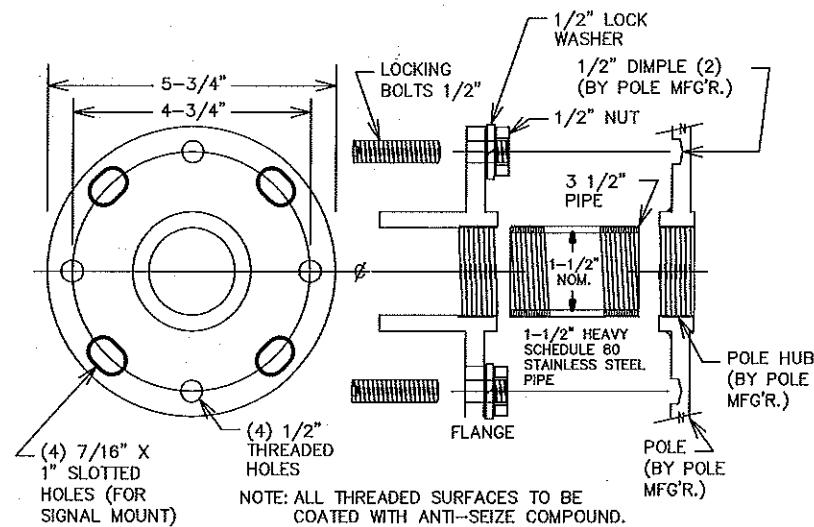
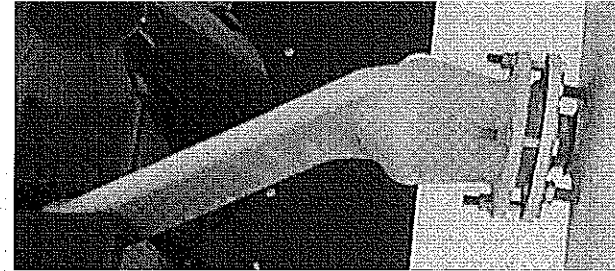
5 SECTION FYA  
CLUSTER HEAD DETAIL



TYPICAL SIGNAL POLE MOUNTING  
NOT TO SCALE

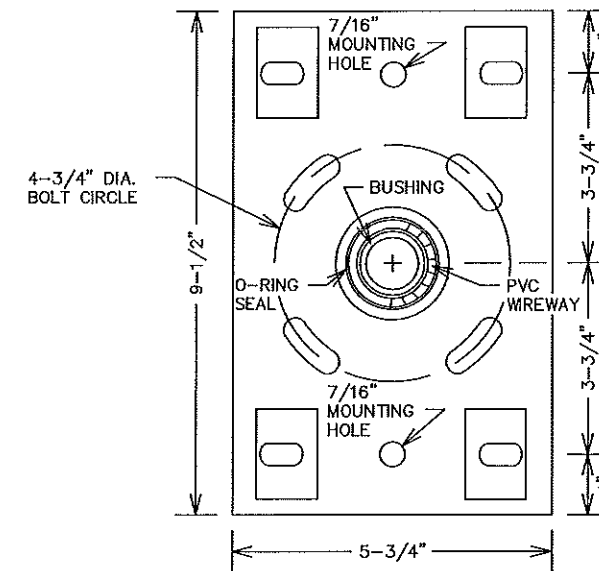


THREADED HUB AND FLANGE POLE ADAPTOR

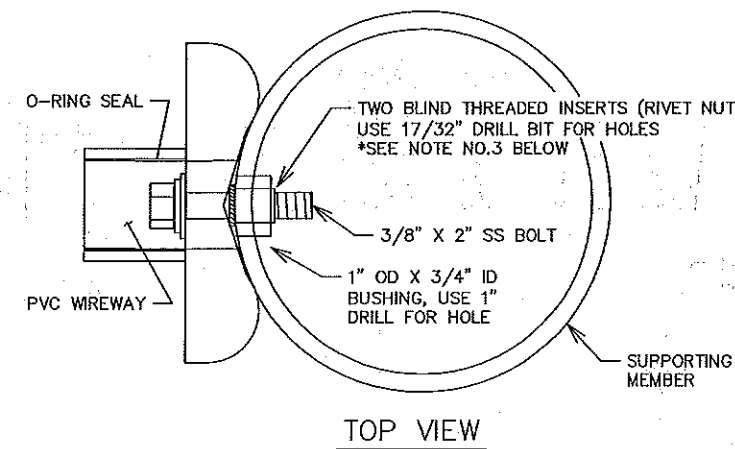


EXTENDED THREADED POLE ADAPTOR

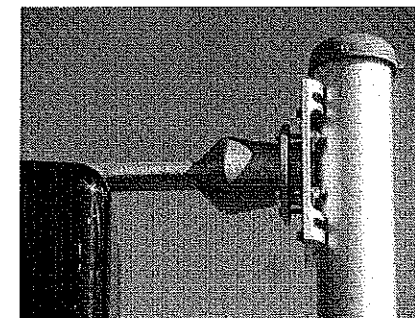
- NOTES:
1. ALL THREADED SURFACES TO BE COATED WITH ANTI-SEIZE COMPOUND.
  2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLY HEADS.
  3. SEE STANDARD PLATE NUMBER 8123 FOR ADDITIONAL SIGNAL POLE DETAILS.
  4. EXTENDED THREADED POLE ADAPTOR ONLY USED WITH 5 SECTION CLUSTER HEADS.



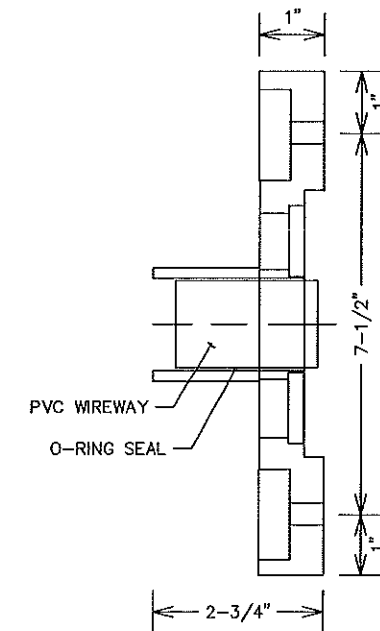
BOLT ON HUB & FLANGE



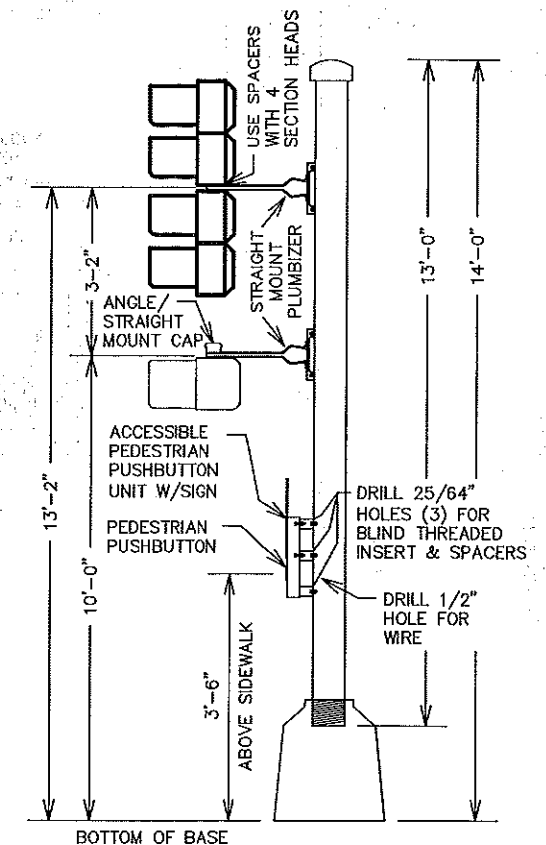
TOP VIEW



- NOTES:
1. ALL THREADED SURFACES TO BE COATED WITH ANTI-SEIZE COMPOUND.
  2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLY HEADS.
  3. BLIND THREADED INSERTS (RIVET NUT) MUST BE INSERTED USING MANUFACTURERS SPECIFIC INSERTION TOOL. NO OTHER METHOD IS ACCEPTABLE.
  4. SEE STANDARD PLATE NUMBER 8122 FOR ADDITIONAL PEDESTAL POLE DETAILS.

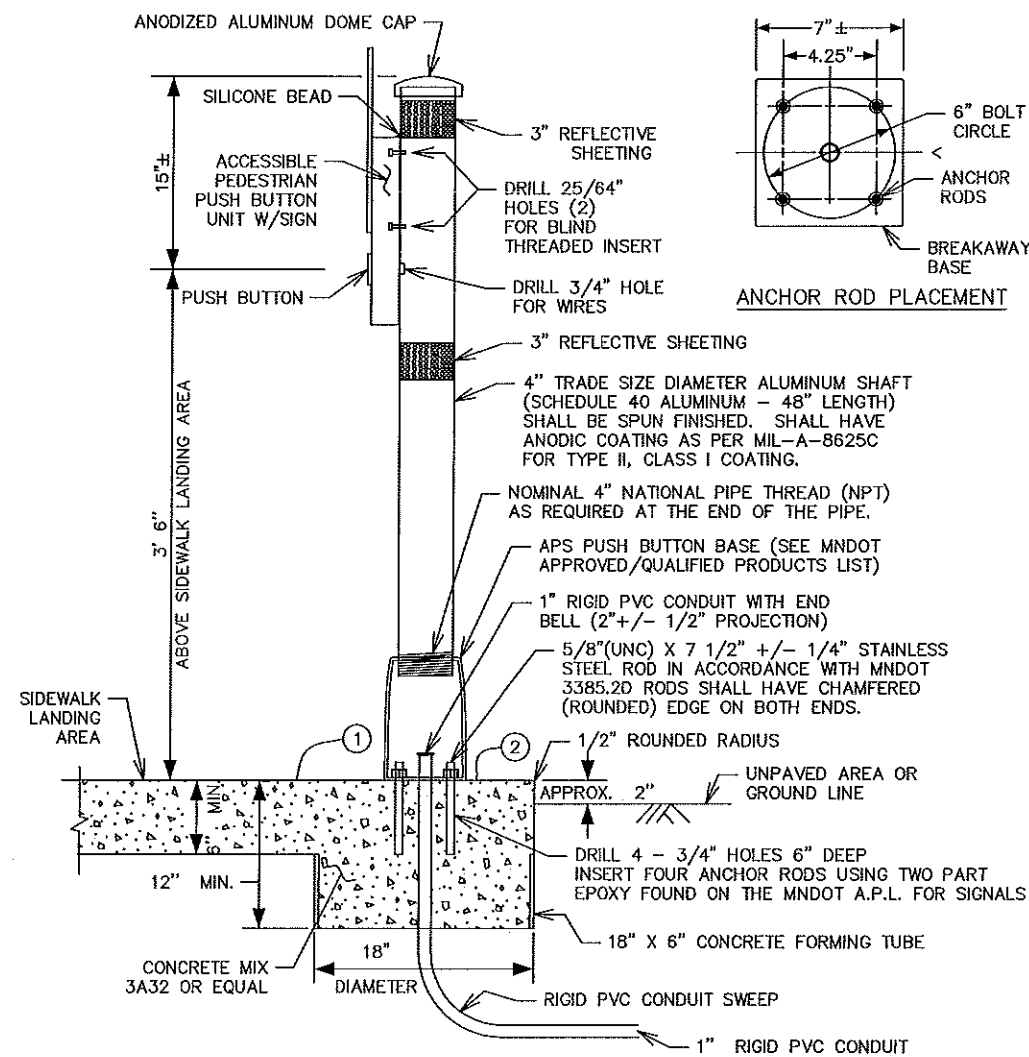


SIDE VIEW



TYPICAL PEDESTAL MOUNTING  
NOT TO SCALE

APS PUSH BUTTON STATION



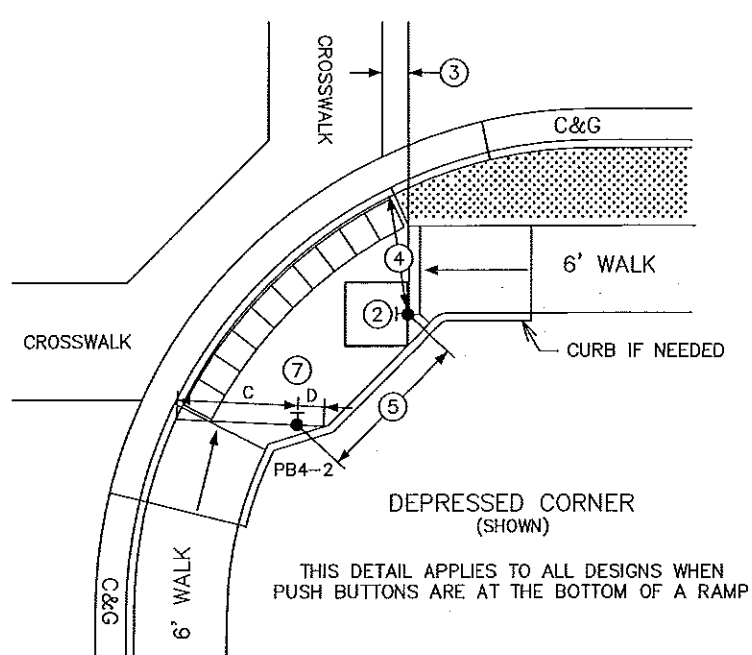
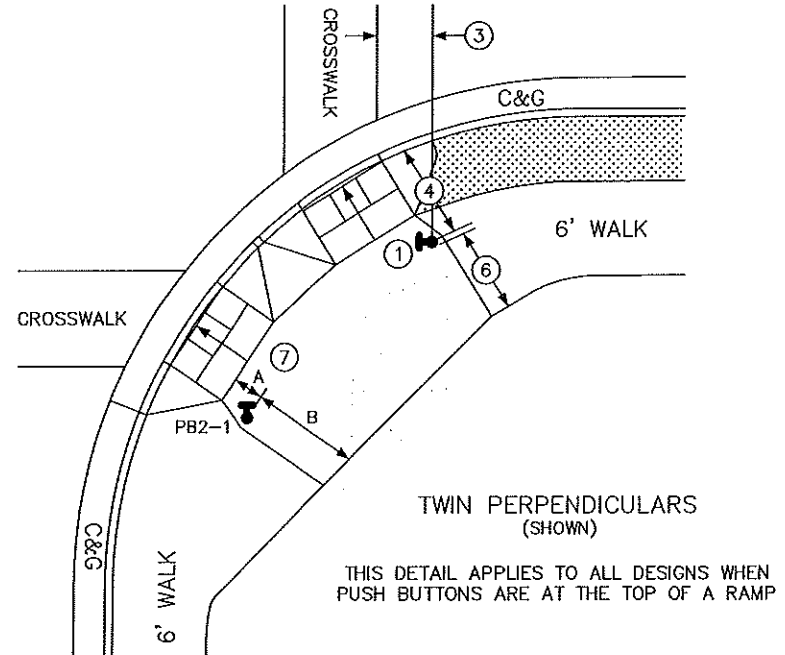
- NOTES:
- PLACEMENT AND ORIENTATION OF THE PUSH BUTTON STATION IS CRITICAL. MOUNT THE BUTTON SO THAT THE FACE IS PARALLEL WITH THE ASSOCIATED CROSSWALK. SCREW IN POST TO A TIGHTENED POSITION BEFORE MOUNTING ACCESSIBLE PEDESTRIAN PUSH BUTTON UNIT TO THE POST.
  - ORIENT ACCESS OPENING ON THE BREAKAWAY PEDESTAL DIRECTLY BELOW THE APS BUTTON.
  - PLUMB THE PUSH BUTTON STATION WITH LEVELING SHIMS IN ACCORDANCE WITH STANDARD PLATE 8129.
  - BLIND THREADED INSERTS (RIVET NUT) MUST BE INSERTED USING MANUFACTURERS SPECIFIC INSERTION TOOL. NO OTHER METHOD IS ACCEPTABLE.
  - BLIND THREADED INSERTS SHALL BE ZINC PLATED STEEL WITH 1/4 - 20 UNC THREADS. INSERT SHALL BE SUITABLE FOR USE ON A MOUNTING SURFACE WALL THICKNESS OF .337". APPROVED BLIND THREADED INSERTS CAN BE FOUND ON THE MN/DOT QUALIFIED PRODUCTS LIST FOR SIGNALS.
  - A.P.S. MOUNTING BOLTS SHALL BE 1/4 - 20 STAINLESS STEEL. APPLY BRUSH ON ANTI SEIZE COMPOUND TO BOLTS PRIOR TO ASSEMBLY.
  - APPLY A BEAD OF 100% SILICONE SEALANT ALONG THE TOP OF THE PUSH BUTTON UNIT WHERE IT COMES IN CONTACT WITH THE 4" POST.
  - THE REFLECTIVE SHEETING SHALL BE WHITE AT INTERSECTION CORNERS AND SHALL BE YELLOW WHEN USED IN CENTER MEDIANS. SEE MN/DOT SIGNING QUALIFIED PRODUCTS LIST (QPL) FOR APPROVED TUBE DELINEATOR SHEETING.
  - ANTI-SEIZE COMPOUND MUST BE USED ON ALL THREADED BOLTS WHEN ASSEMBLING PEDESTRIAN PUSH BUTTON STATIONS.
- ① THE PUSH BUTTON STATION FOUNDATION IS CONSTRUCTED AS PART OF THE SIDEWALK. INCREASE THE SIDEWALK THICKNESS TO 12" THICK (MIN.) TO PROVIDE FOR THE PUSH BUTTON STATION FOUNDATION.
- ② ALL JOINTS SHALL BE A MINIMUM OF 9" FROM THE CENTER OF THE PUSH BUTTON FOUNDATION.

TYPICAL APS PEDESTRIAN PUSH BUTTON LOCATION

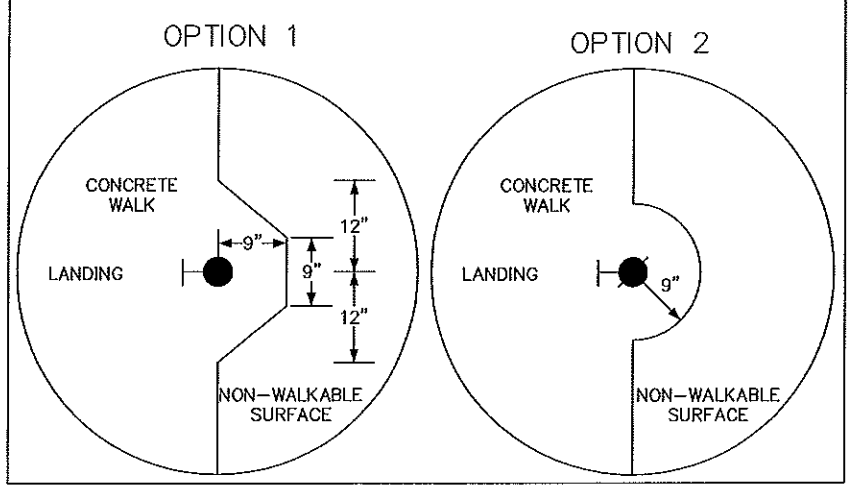
THIS IS A GENERAL DETAIL INTENDED TO SHOW THE REQUIREMENTS OF APS PUSH BUTTON LOCATION. FOR PROJECT SPECIFIC INFORMATION REGARDING PEDESTRIAN RAMP LAYOUT AND PUSH BUTTON LOCATIONS, SEE THE PLAN.

SUPPLEMENTAL GUIDANCE FOR CONSTRUCTING COMPLIANT APS PUSH BUTTONS:

- THE FACE OF THE BUTTON SHALL BE PARALLEL WITH THE OUTSIDE EDGE OF CROSSWALK.
- A MINIMUM 4 FT X 4 FT LANDING AREA SHALL BE PROVIDED ADJACENT TO EACH BUTTON, WITH A 2 PERCENT MAXIMUM SLOPE IN ALL DIRECTIONS.
- BUTTONS SHALL BE WITHIN 5 FT OF THE OUTSIDE EDGE OF THE CROSSWALK.
- BUTTONS SHALL BE BETWEEN 1.5 FT AND 10 FT FROM THE BACK OF CURB OR EDGE OF ROADWAY, MEASURED IN THE DIRECTION OF TRAVEL. STANDALONE PUSH BUTTON STATIONS SHOULD BE 4' MINIMUM FROM THE BACK OF CURB TO AVOID KNOCKDOWNS.
- BUTTONS SHALL BE AT LEAST 10 FT APART.
- PROVIDE A MAINTENANCE ACCESS ROUTE (MAR) WHEREVER POSSIBLE FOR SNOW REMOVAL PURPOSES. A MAR REQUIRES A 6 FT MINIMUM CLEAR DISTANCE BETWEEN A PUSH BUTTON AND ANY OBSTRUCTIONS, INCLUDING BUILDINGS, V-CURB, ELECTRICAL FOUNDATIONS, SIGNAL CABINETS, OR ANOTHER PUSH BUTTON.
- BUTTON SHOULD BE 2 FT MINIMUM FROM RAMP GRADE BREAK AND BACK OF WALK.



CONTRACTOR MUST USE OPTION 1 OR 2 WHEN THE APS PUSH BUTTON IS SHOWN AT THE EDGE OF WALK. OPTION USED (OR SELECTED) MUST BE THE SAME THROUGHOUT THE ENTIRE PROJECT.



SIGNAL CONTROL POINTS			DISTANCE TO FRONT OF LANDING (FT)	DISTANCE TO BACK OF LANDING (FT)
SIGNAL NO.	X	Y		
PB2-1	-	-	A	B
PB4-2	-	-	C	D

- A - DISTANCE MEASURED FROM THE PUSH BUTTON TO THE FRONT OF LANDING/TOP OF RAMP
- B - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE BACK OF LANDING/EDGE OF WALK
- C - CLEAR DISTANCE MEASURED FROM THE PUSH BUTTON TO THE OUTSIDE EDGE OF DOMES IN THE DIRECTION OF TRAVEL
- D - CLEAR DISTANCE FROM THE PUSH BUTTON TO THE BACK OF LANDING MEASURED IN THE OPPOSITE DIRECTION OF TRAVEL

EXISTING POLES					
STATION LOCATION	INPLACE UTILITY	LEAVE AS IS	SALVAGE LUMINAIRE	REMOVE LIGHT FOUNDATION	NOTES
NW QUADRENT N BDWY & 1ST ST	DECO LIGHT	X			
NW QUADRENT N BDWY & 1ST ST	STREET LIGHT		X	X	
NE QUADRENT N BDWY & 1ST ST	STREET LIGHT		X	X	
SE QUADRENT N BDWY & 1ST ST	STREET LIGHT		X	X	
SE QUADRENT N BDWY & 1ST ST	DECO LIGHT	X			
SW QUADRENT N BDWY & 1ST ST	DECO LIGHT	X			
SW QUADRENT N BDWY & 1ST ST	STREET LIGHT		X	X	
<div>NOTES:</div> <div>THE "LEAVE AS IS" AND "RELOCATE" COLUMNS ARE BASED UPON THE BEST INFORMATION AVAILABLE AND MAY NOT REFLECT THE ACTUAL EFFECTS ON THE UTILITIES CONSTRUCTION. ACTUAL DETERMINATION WILL BE MADE IN THE FIELD DURING CONSTRUCTION.</div> <div>UTILITIES ARE SHOWN AT APPROXIMATE LOCATIONS. THE CONTRATOR SHALL DETERMINE THE ACTUAL LOCATION OF ALL UTILITIES IN THE FIELD.</div> <div>THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING CONCRETE FOUNDATIONS AND MODIFYING ANY THROUGH CONDUITS TO MAINTAIN CONDUIT RUNS TO STREET LIGHTS</div>					


CONSTRUCT CONC. WALK, CURB & GUTTER			
LOCATION	B624 C&G	6" WALK	TRUNCATED DOME
	(LIN FT)	(SQ FT)	(SQ FT)
NW QUADRENT N BDWY & 1ST ST	39.38	547.22	16.00
NE QUADRENT N BDWY & 1ST ST	39.34	411.82	32.00
SE QUADRENT N BDWY & 1ST ST	39.47	395.36	32.00
SW QUADRENT N BDWY & 1ST ST	39.12	513.33	16.00
TOTALS	158	1868	96

PAVEMENT MARKINGS	
LOCATION	12" SOLID LINE WHITE
	(LIN FT)
NW QUADRENT N BDWY & 1ST ST	70.2
NE QUADRENT N BDWY & 1ST ST	103.2
SE QUADRENT N BDWY & 1ST ST	101.0
SW QUADRENT N BDWY & 1ST ST	73.6
TOTALS	349

REMOVE CONC. WALK, CURB & GUTTER		
LOCATION	C&G	WALK
	(LIN FT)	(SQ YD)
NW QUADRENT N BDWY & 1ST ST	39.1	60.2
NE QUADRENT N BDWY & 1ST ST	39.2	45.1
SE QUADRENT N BDWY & 1ST ST	39.4	43.5
SW QUADRENT N BDWY & 1ST ST	39.1	63.9
TOTALS	157	213

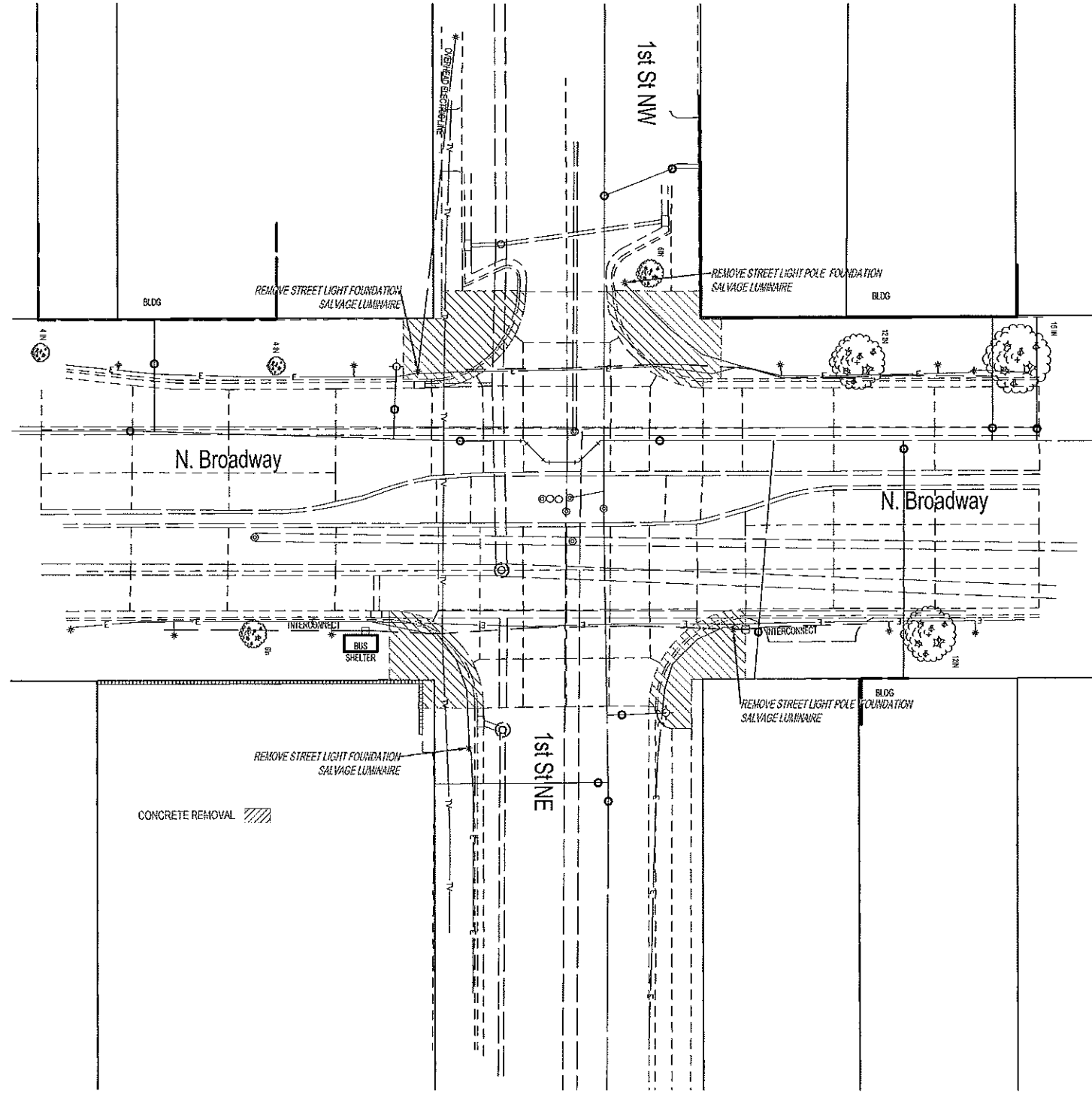
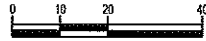
EROSION CONTROL		
LOCATION	INLET PROTECTION TYPE C	EROSION CONTROL SUPERVISOR
	EACH	LUMP SUM
SE QUADRENT N BDWY & 1ST ST	1.00	
SW QUADRENT N BDWY & 1ST ST	1.00	
	2	1

Revision comment	Revised
I hereby certify that this plan was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota. <i>Russell A. Khan</i> Date: 5-6-15 Lic. No. 24667	




City of Rochester, Minnesota  
Department of Public Works

TABULATIONS FOR TRAFFIC SIGNAL SYSTEM AT  
NORTH BROADWAY AND 1ST STREET NORTH



Revision comment:	
Revised:	
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Russell A. Khan Date: 5-5-15 Lic. No. 24687	



City of Rochester, Minnesota  
Department of Public Works

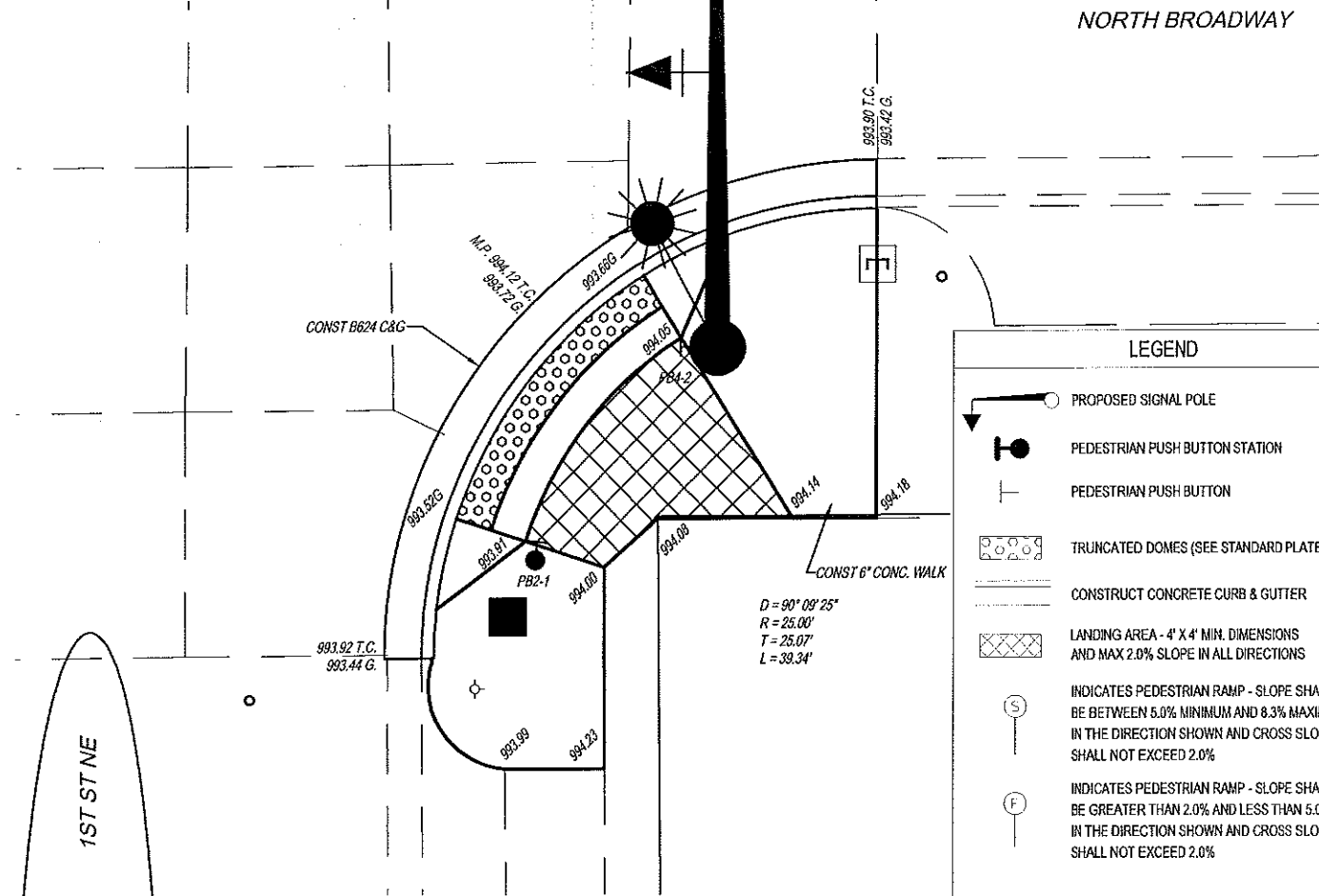
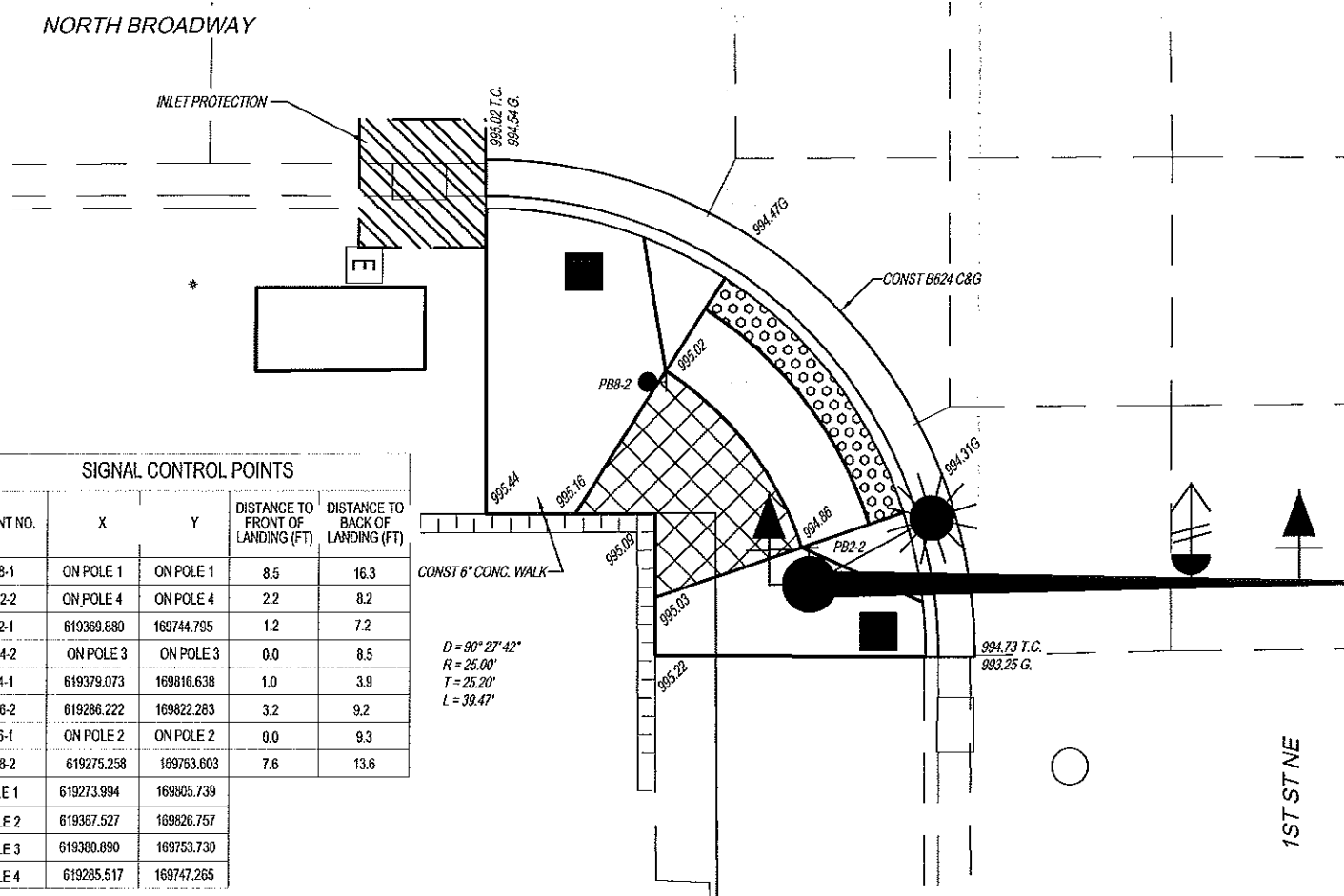
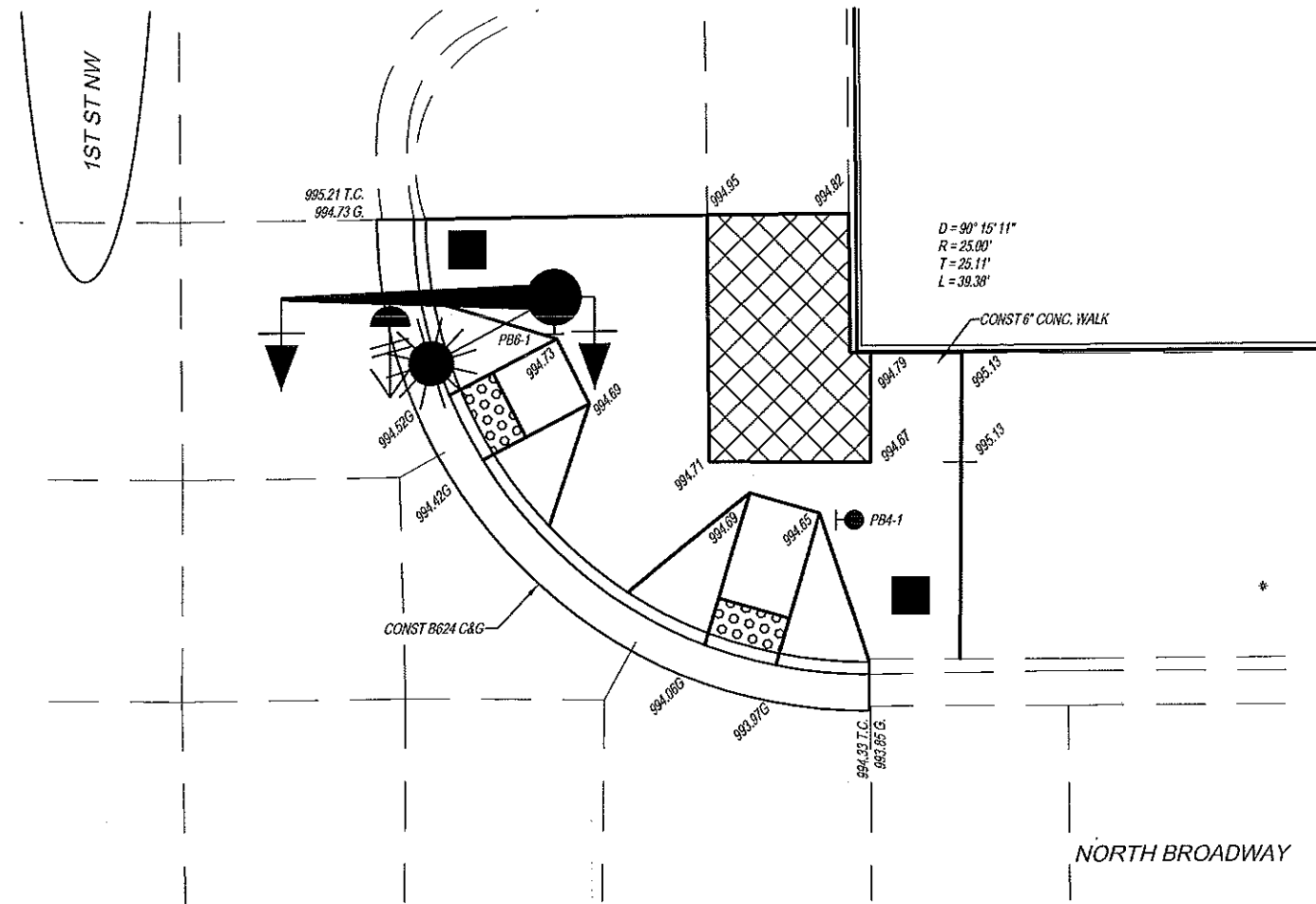
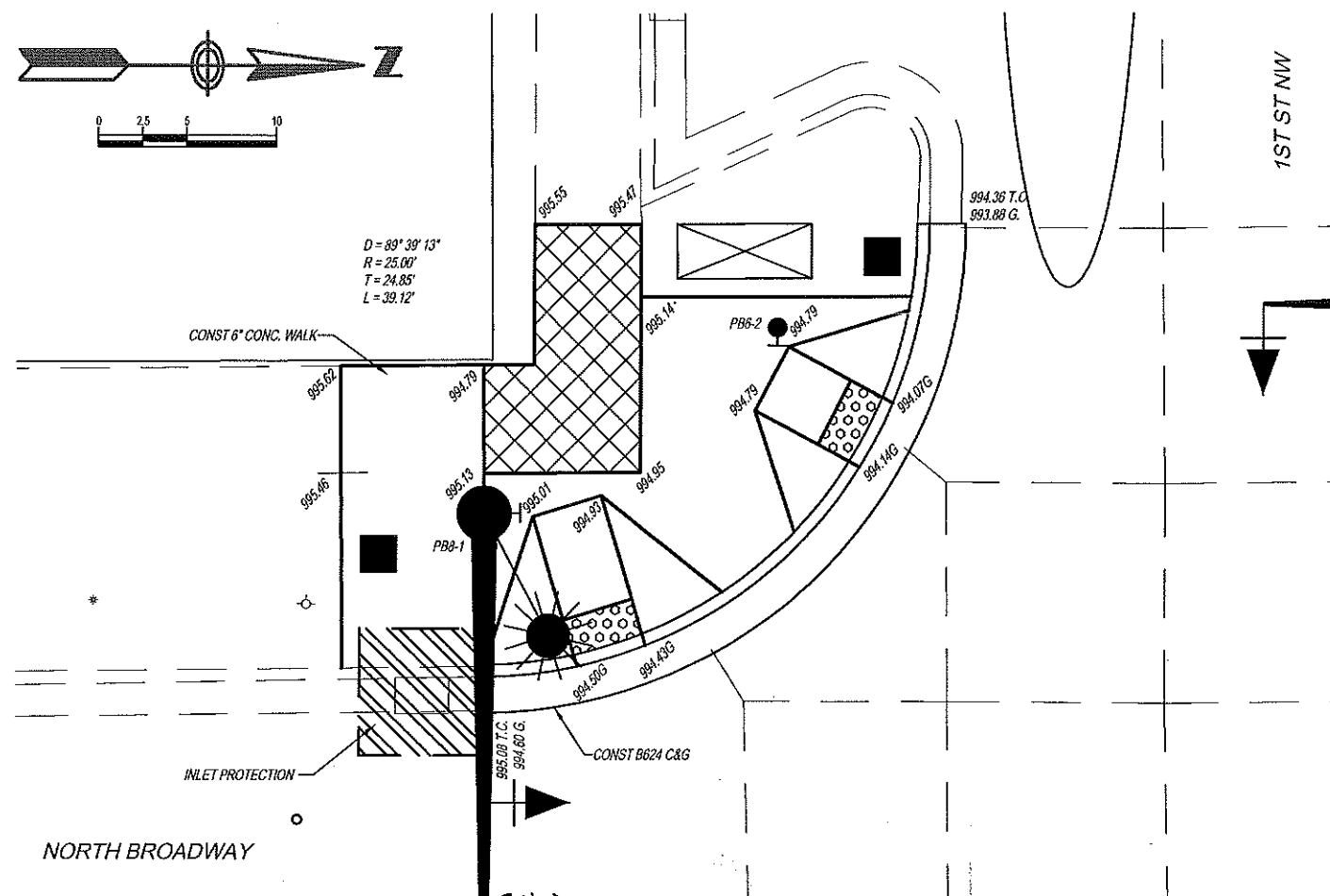
201 4th Street S.E.  
Rochester, MN 55904  
Phone: (507) 228-2480  
Fax: (507) 339-5401

Title:  
REMOVALS FOR TRAFFIC SIGNAL SYSTEM AT NORTH  
BROADWAY AND 1ST STREET NORTH

Designer: CMF
Checker: RJK


Project No. M14-30 J 6053  
Sheet 8 of 13 Sheets





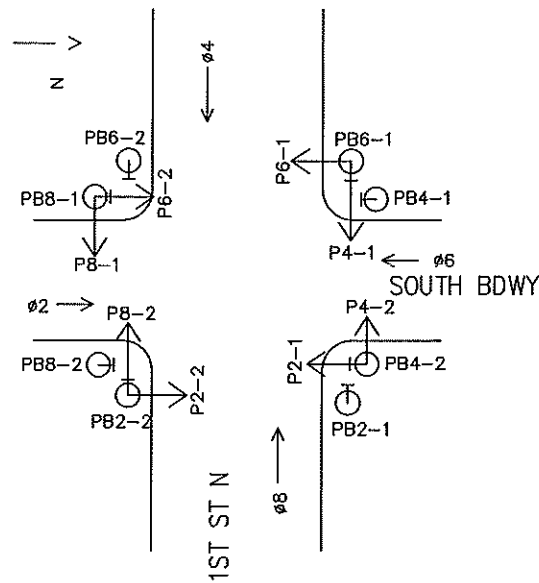
SIGNAL CONTROL POINTS						
POINT NO.	X		Y		DISTANCE TO FRONT OF LANDING (FT)	DISTANCE TO BACK OF LANDING (FT)
PB8-1	ON POLE 1		ON POLE 1		8.5	16.3
PB2-2	ON POLE 4		ON POLE 4		2.2	8.2
PB2-1	619369.880		169744.795		1.2	7.2
PB4-2	ON POLE 3		ON POLE 3		0.0	8.5
PB4-1	619379.073		169816.638		1.0	3.9
PB6-2	619286.222		169822.263		3.2	9.2
PB6-1	ON POLE 2		ON POLE 2		0.0	9.3
PB8-2	619275.258		169763.603		7.6	13.6
POLE 1	619273.994		169905.739			
POLE 2	619367.527		169826.757			
POLE 3	619380.890		169753.730			
POLE 4	619285.517		169747.265			

Revision comment: \_\_\_\_\_  
 Revisit: \_\_\_\_\_  
 I hereby certify that this plan was prepared by me or under my direct supervision  
 and that I am a duly Licensed Professional Engineer under the laws of the  
 State of Tennessee.  
 \_\_\_\_\_ Date: 5-8-15 Lic. No. 24657

 **City of Rochester, Minnesota**  
**Department of Public Works**  
201 4th Street S.E.  
Rochester, MN 55904  
Phone: (507) 339-2460  
Fax: (507) 339-2461

Project No. M14-30 Sheet 9 of 13 Sheets	Title: GRADING FOR TRAFFIC SIGNAL SYSTEM AT NORTH BROADWAY AND 1ST STREET NORTH	
	Designer: CWF	Checker: RJK

# CONTROLLER PHASING, PEDESTRIAN INDICATIONS AND PUSH BUTTONS LAYOUT



**(A) EQUIPMENT PAD - SEE DETAILS**  
 INSTALL CONTROLLER AND CABINET  
 PAD MOUNTED LOAD CENTER

**BETWEEN CONTROLLER CABINET  
 AND LOAD CENTER**  
 2" NMC  
 2-1/4" GR  
 1-1/4" GR

**LOAD CENTER TO HH 1**  
 2" NMC  
 2-3/4" #14

**LOAD CENTER TO HH 8**  
 2" NMC  
 2-3/4" #14

**(1) FBI PA90 FOUNDATION**  
 TYPE PA90-30-D40-12 (DAVIT AT 360°)  
 LUMINAIRE LED  
 2-ONE WAY SIGNAL OVERHEAD 2' 14" FORM END OF MAST ARM  
 ONE EVP DET AND INDICATOR LIGHT AND INSTALLED (08/08)  
 1-SIGN 1 ST SOUTH (SEE DETAIL)

**EXTEND TO HHS 8**  
 3" NMC  
 1-12C #14  
 2-4C #14  
 3-3C #14  
 1-2C #14  
 1-3C #20  
 1-1/4" #18 INS GR

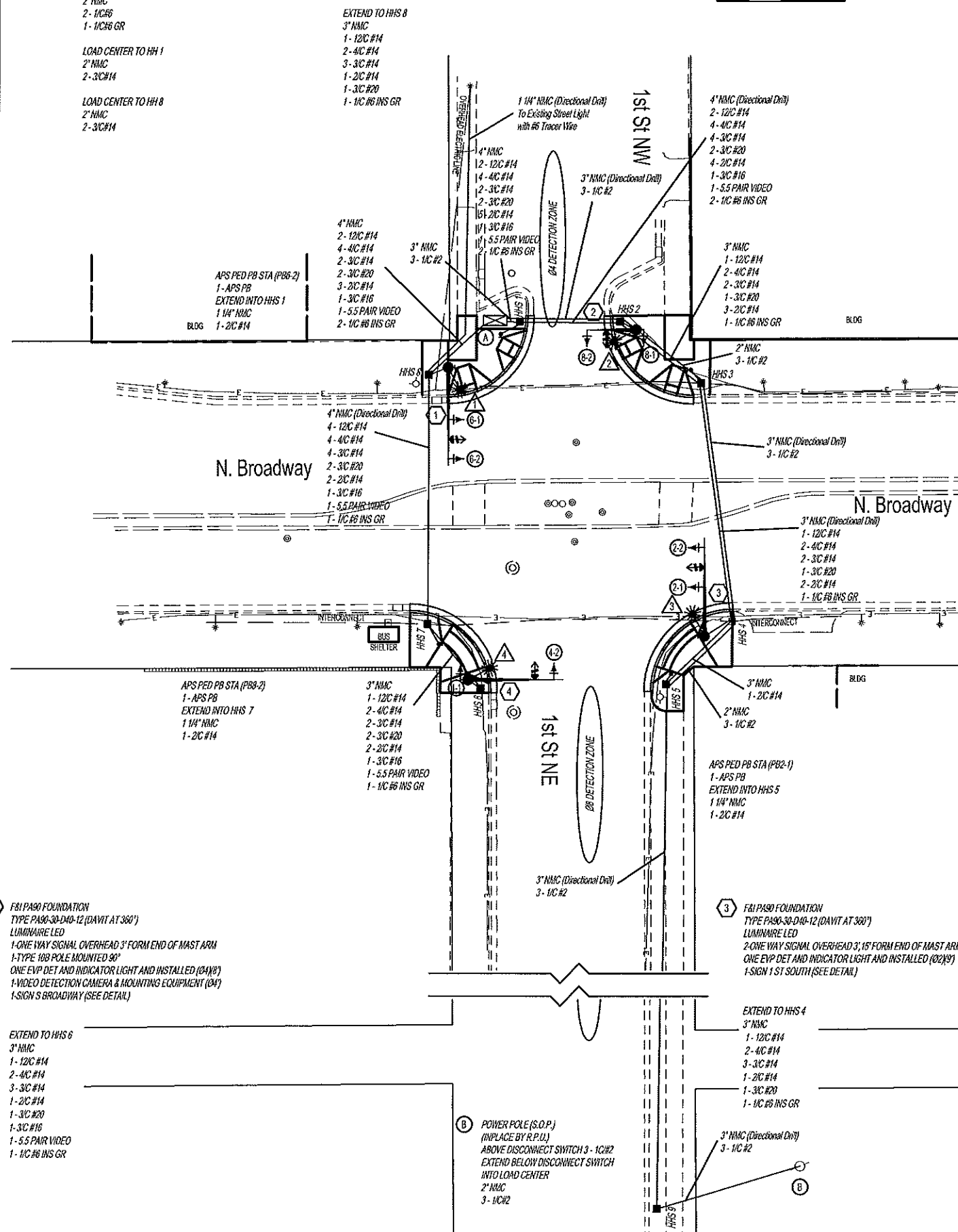
**(2) FBI PA85 FOUNDATION**  
 TYPE PA85-15-D40-12 (DAVIT AT 360°)  
 LUMINAIRE LED  
 1-ONE WAY SIGNAL OVERHEAD 0' FORM END OF MAST ARM  
 1-TYPE 108 POLE MOUNTED 90°  
 ONE EVP DET AND INDICATOR LIGHT AND INSTALLED (08/08)  
 1-VIDEO DETECTION CAMERA & MOUNTING EQUIPMENT (08)  
 1-SIGN S BROADWAY (SEE DETAIL)

**EXTEND TO HHS 2**  
 3" NMC  
 1-12C #14  
 2-4C #14  
 3-3C #14  
 1-2C #14  
 1-3C #20  
 1-3C #16  
 1-5.5 PAIR VIDEO  
 1-1/4" #18 INS GR

## SIGNAL INDICATIONS (12" LED HEADS)

FACE	R	Y	G
2-1	●	●	●
2-2	●	●	●
4-1	●	●	●
4-2	●	●	●
6-1	●	●	●
6-2	●	●	●
8-1	●	●	●
8-2	●	●	●

-ALL SIGNAL INDICATIONS SHALL BE 12" LED  
 -ALL SIGNAL HEADS SHALL BE BLACK  
 POLYCARBONITE WITH BACKGROUND SHIELDS



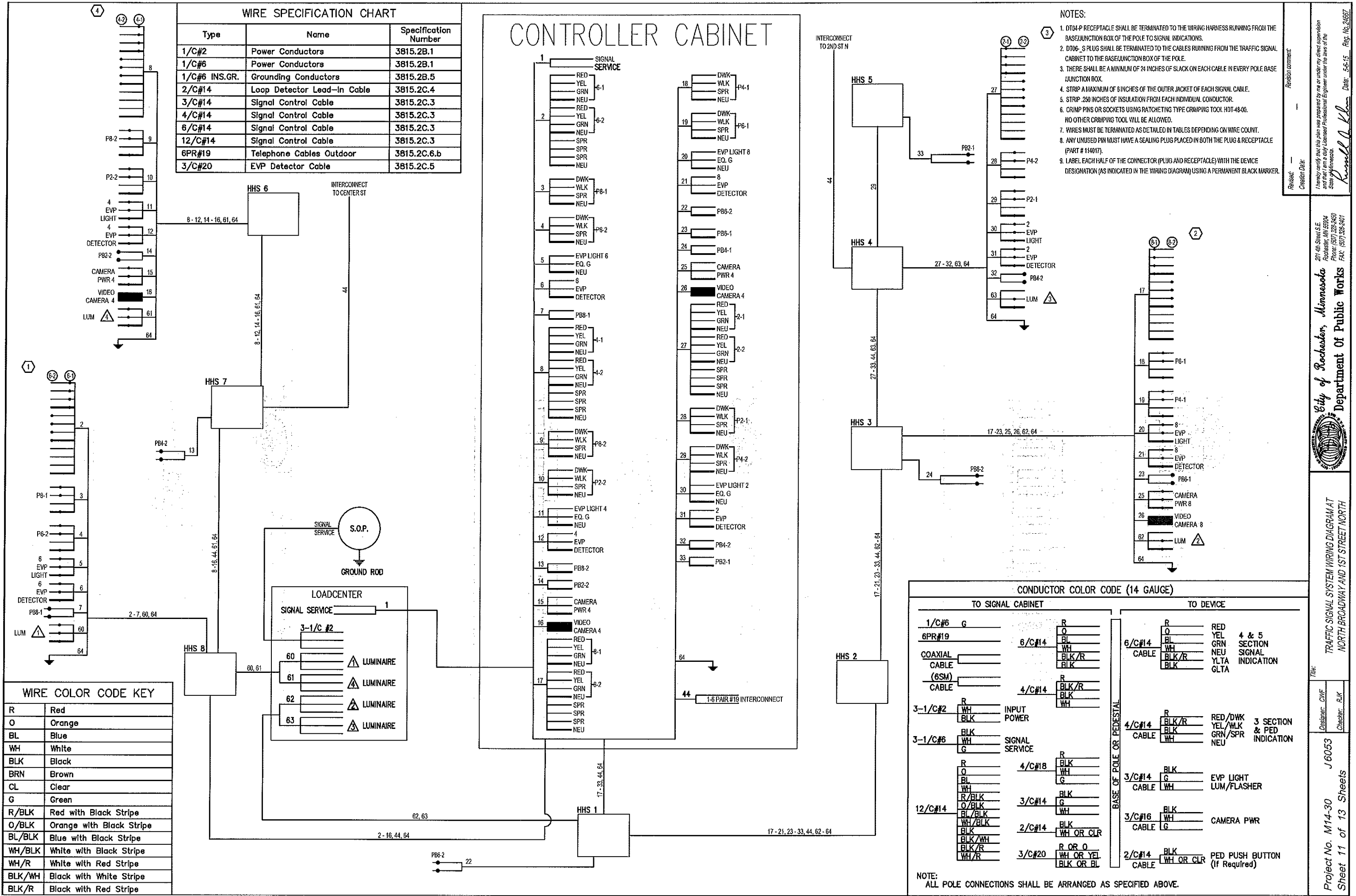
## NOTES:

- LOCATION OF POLES, VIDEO DETECTION ZONES, EQUIPMENT PAD AND HANDHOLES SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
- EACH SIGNAL FACE SHALL HAVE BACKGROUND SHIELD.
- EACH PEDESTRIAN INDICATION SHALL BE ONE SECTION HANDWALKING PERSON INDICATION, WITH COUNT DOWN TIMER THE HAND INDICATION BEING AN LED INDICATION. SEE SPECIAL PROVISIONS. THE CITY SHALL PROVIDE PEDESTRIAN PUSHBUTTON SIGNS.
- ALL HANDHOLES SHALL BE PVC HANDHOLES WITH METAL FRAMES AND COVERS (PER MNDOT STANDARD PLATE NO. 8114A).
- SEE SPECIAL PROVISIONS REGARDING SIGN PANELS TO BE FURNISHED AND INSTALLED BY CONTRACTOR.
- SEE SPECIAL PROVISIONS FOR INFORMATION REGARDING AND CITY FURNISHED MATERIALS.
- A 7/8" HALF COUPLING, 7/8" PIPE NIPPLE AND CONDUIT OUTLET BODY SHALL BE FURNISHED AND INSTALLED APPROX. 71" FROM LEFT END OF ALL MAST ARMS.
- ALL VEHICLE SIGNAL INDICATIONS SHALL BE LED. SEE SPECIAL PROVISIONS.
- EVP EQUIPMENT, VIDEO DETECTION EQUIPMENT AND BRACKETING, SIGNAL POLES, HEADS, CABINET AND CONTROLLER WILL BE PROVIDED BY THE CITY.
- ALL NEW CONDUIT SHALL BE NMC - SCHEDULE 80 OR HDPE SCHEDULE 80 AND CARRY 1-1/4" #6 INSULATED GROUNDING CONDUCTOR AS SHOWN IN PLAN.
- DOUBLE HUBS AT 90°, 180°, AND 240°
- SEE DIVISION SS FOR BRACKETING REQUIREMENTS
- THE CONTRACTOR SHALL INSTALL ELECTRICAL EQUIPMENT AND SIGNAL CABINET - FURNISHED BY THE CITY - AND SHALL MAKE ALL FIELD CONNECTIONS TO MAKE THE SIGNAL SYSTEM OPERATIONAL.
- THE CONTRACTOR SHALL FURNISH AND INSTALL SERVICE (W / METER).
- THE CONTRACTOR SHALL LOCATE AND VERIFY INPLACE UTILITIES PRIOR TO COMMENCING WORK.
- FOR SIGN TYPE "D" SEE MAST ARM SIGNING DETAILS.
- EVP DETECTION & CONFIRMATORY LIGHTS SHALL BE MOUNTED 6' FROM END OF THE MAST ARM. A1-3/4" #20 CABLE SHALL BE WIRED DIRECT TO THE EVP DETECTOR - CONTINUOUS WITHOUT SPLICES FROM THE CABINET. 2-1/4" #14 SHALL BE WIRED FROM THE CONFIRMATORY LIGHT TO THE TERMINAL BLOCK IN IN EACH POLE BASE.
- THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE POWER COMPANY TO ARRANGE FOR THE POWER CONNECTION.
- THE CONTRACTOR SHALL PULL BACK THE EXISTING INTERCONNECT WIRE ONE DIRECTION (FROM 2ND ST N) AND INSTALL NEW CABLE THE OTHER DIRECTION. (FROM CENTER ST)
- THE CONTRACTOR SHALL REMOVE ALL EXISTING CABLE NOT REUSED, COIL AND DELIVER TO CITY TRAFFIC OPERATION BUILDING.
- TRENCH AND REPLACED AS NECESSARY. THE OPEN TRENCH FOR CONDUIT REPLACEMENT.
- THE CONTRACTOR SHALL FURNISH, INSTALL, AND MAINTAIN ALL SIGNING AND BARRICADING AS PER MNDOT TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS FIELD MANUAL.
- NO WORK ON THE PROJECT SHALL STARTED THAT WILL INTERFERE WITH TRAFFIC FLOW UNTIL ALL NEW EQUIPMENT OR MATERIALS ARE DELIVERED AT THE JOB SITE AND READY FOR INSTALLATION.

WIRE SPECIFICATION CHART		
Type	Name	Specification Number
1/C#2	Power Conductors	3815.2B.1
1/C#6	Power Conductors	3815.2B.1
1/C#6 INS.GR.	Grounding Conductors	3815.2B.5
2/C#14	Loop Detector Lead-In Cable	3815.2C.4
3/C#14	Signal Control Cable	3815.2C.3
4/C#14	Signal Control Cable	3815.2C.3
6/C#14	Signal Control Cable	3815.2C.3
12/C#14	Signal Control Cable	3815.2C.3
6PR#19	Telephone Cables Outdoor	3815.2C.6.b
3/C#20	EVP Detector Cable	3815.2C.5

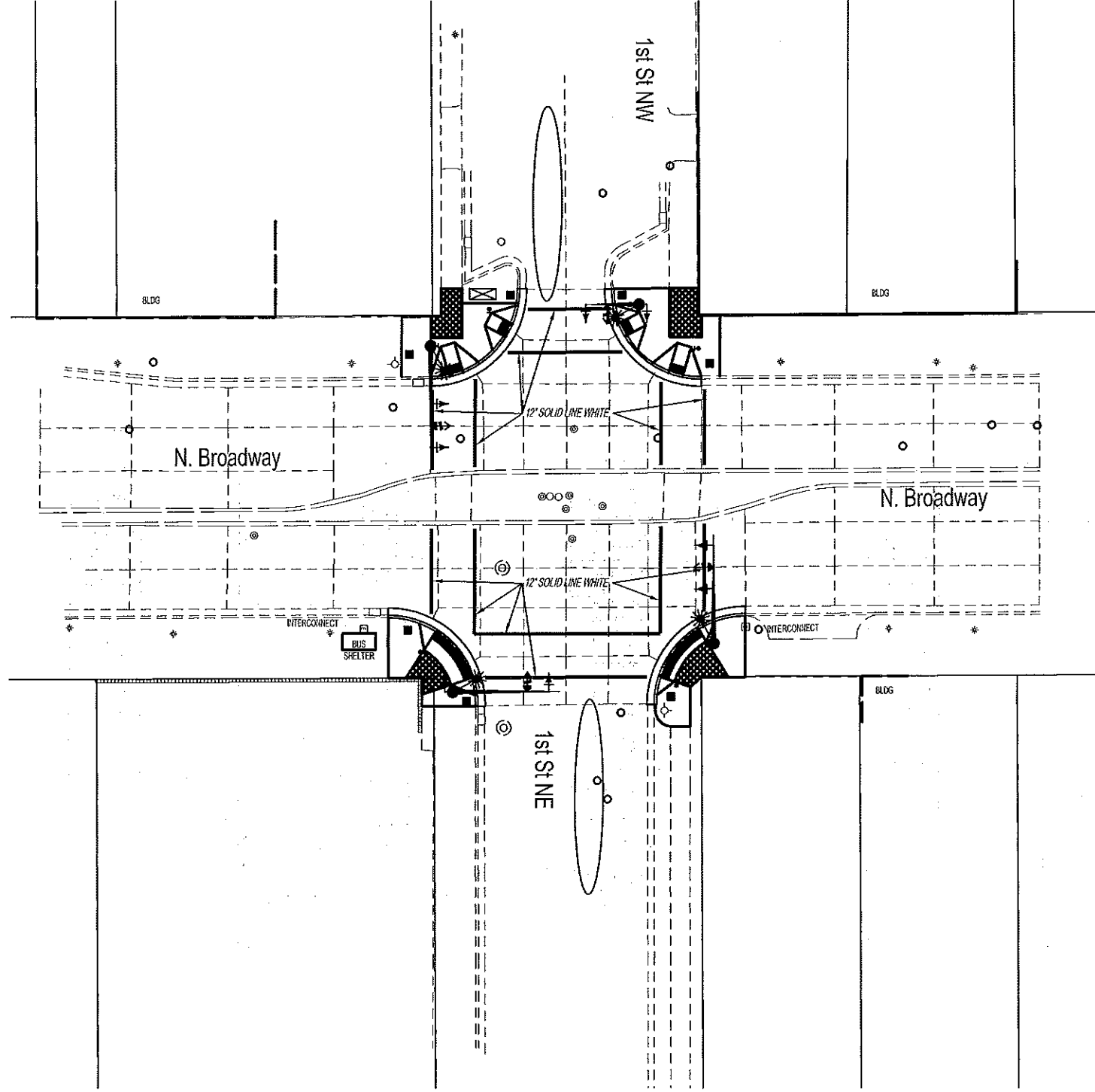
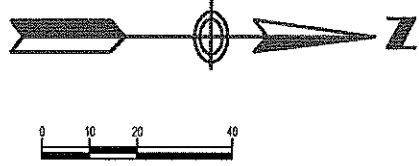
# CONTROLLER CABINET

- NOTES:
1. DT84-P RECEPTACLE SHALL BE TERMINATED TO THE WIRING HARNESS RUNNING FROM THE BASE/JUNCTION BOX OF THE POLE TO SIGNAL INDICATIONS.
  2. DT06-S PLUG SHALL BE TERMINATED TO THE CABLES RUNNING FROM THE TRAFFIC SIGNAL CABINET TO THE BASE/JUNCTION BOX OF THE POLE.
  3. THERE SHALL BE A MINIMUM OF 24 INCHES OF SLACK ON EACH CABLE IN EVERY POLE BASE/JUNCTION BOX.
  4. STRIP A MAXIMUM OF 8 INCHES OF THE OUTER JACKET OF EACH SIGNAL CABLE.
  5. STRIP 250 INCHES OF INSULATION FROM EACH INDIVIDUAL CONDUCTOR.
  6. CRIMP PINS OR SOCKETS USING RATCHETING TYPE CRIMPING TOOL HDT-48-00. NO OTHER CRIMPING TOOL WILL BE ALLOWED.
  7. WIRES MUST BE TERMINATED AS DETAILED IN TABLES DEPENDING ON WIRE COUNT.
  8. ANY UNUSED PIN MUST HAVE A SEALING PLUG PLACED IN BOTH THE PLUG & RECEPTACLE (PART # 114017).
  9. LABEL EACH HALF OF THE CONNECTOR (PLUG AND RECEPTACLE) WITH THE DEVICE DESIGNATION (AS INDICATED IN THE WIRING DIAGRAM) USING A PERMANENT BLACK MARKER.



WIRE COLOR CODE KEY	
R	Red
O	Orange
BL	Blue
WH	White
BLK	Black
BRN	Brown
CL	Clear
G	Green
R/BLK	Red with Black Stripe
O/BLK	Orange with Black Stripe
BL/BLK	Blue with Black Stripe
WH/BLK	White with Black Stripe
BLK/WH	Black with White Stripe
BLK/R	Black with Red Stripe

CONDUCTOR COLOR CODE (14 GAUGE)			
TO SIGNAL CABINET		TO DEVICE	
1/C#6 G	R	R	RED
6PR#19	O	O	ORANGE
COAXIAL CABLE	BL	BL	BLUE
(6SM) CABLE	WH	WH	WHITE
3-1/C#2	BLK/R	BLK/R	BLACK WITH RED STRIPE
3-1/C#6	BLK	BLK	BLACK
	WH	WH	WHITE
	G	G	GREEN
	R/BLK	R/BLK	RED WITH BLACK STRIPE
	O/BLK	O/BLK	ORANGE WITH BLACK STRIPE
	BL/BLK	BL/BLK	BLUE WITH BLACK STRIPE
	WH/BLK	WH/BLK	WHITE WITH BLACK STRIPE
	BLK/WH	BLK/WH	BLACK WITH WHITE STRIPE
	BLK/R	BLK/R	BLACK WITH RED STRIPE
	WH/R	WH/R	WHITE WITH RED STRIPE
	R	R	RED
	O	O	ORANGE
	BL	BL	BLUE
	WH	WH	WHITE
	G	G	GREEN
	R/BLK	R/BLK	RED WITH BLACK STRIPE
	O/BLK	O/BLK	ORANGE WITH BLACK STRIPE
	BL/BLK	BL/BLK	BLUE WITH BLACK STRIPE
	WH/BLK	WH/BLK	WHITE WITH BLACK STRIPE
	BLK/WH	BLK/WH	BLACK WITH WHITE STRIPE
	BLK/R	BLK/R	BLACK WITH RED STRIPE
	WH/R	WH/R	WHITE WITH RED STRIPE



Title:

Designer: CWF  
Checker: RJK

Project No. M14-30 J 6053  
Sheet 12 of 13 Sheets

STRIPING AT NORTH BROADWAY AND 1ST STREET  
NORTH



City of Rochester, Minnesota  
Department of Public Works  
201 4th Street, S.E.  
Rochester, MN 55904  
Phone: (507) 228-2450  
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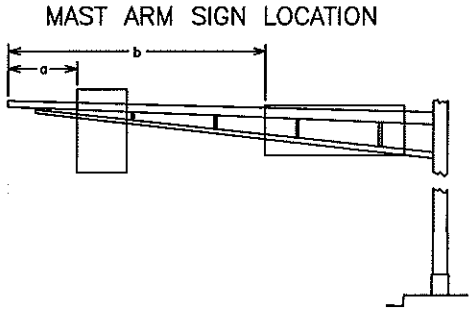
Revision comment: ---  
Revised: ---

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Russell A. Kline Date: 5-5-15 Lic. No. 24667

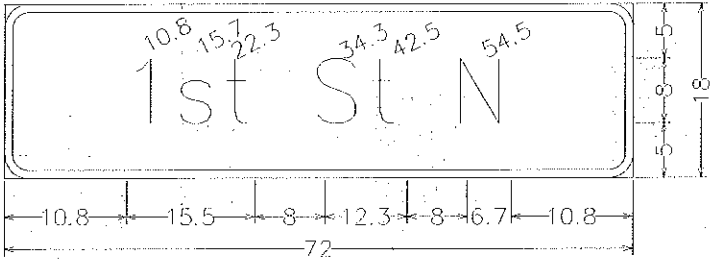
SIGNS – F & I							
SIGN PANEL	SIGN TYPE	a (FT)	b (FT)	SIZE (in.)	NO. REQ.	SQ. FT. PER SIGN	POLE NO.
1st St N	D		15	72 x 18	1	8.3	1
1st St N	D		16	72 x 18	1	8.3	3
1st St N	R	2		30 x 36	1	7.5	2
1st St N	R	5		30 x 36	1	7.5	4
N Broadway	D		7	84 x 18	1	9.0	2
N Broadway	D		9	84 x 18	1	9.0	4

SPECIFIC NOTE:  
(1) SPACING BETWEEN STIFFENERS SHALL NOT EXCEED 36 INCHES AND SHALL BE UNIFORMLY SPACED. SEE STANDARD SIGNS MANUAL, PAGE 105A (REVISION DATE 7/06/07) FOR BRACKET SPACING REQUIREMENTS.

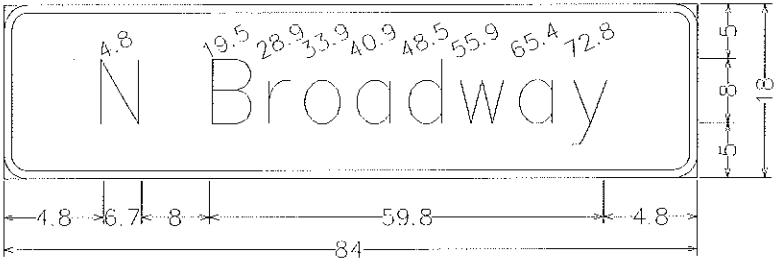
- GENERAL NOTES:
1. CORNERS OF STANDARD SIGN PANELS WITH MARGINS SHALL BE TRIMMED.
  2. TYPE D SIGN PANELS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED.
  3. FOR STRUCTURAL DETAILS OF MAST ARM MOUNTED SIGNS SEE STANDARD SIGNS MANUAL, PAGE 105A.
  4. FOR TYPE "D" STRINGER AND PANEL JOINT DETAILS SEE STANDARD SIGNS MANUAL, PAGE 105.
  5. THE MAST ARM MOUNTED SIGNS ARE INCIDENTAL TO THE SIGNAL SYSTEM PAY ITEM.



R3-5R  
30" x 36"



3.0" Radius, 1.0" Border, White on Green;  
[16th St S] E Mod;



3.0" Radius, 1.0" Border, White on Green;  
[S Broadway] E Mod;